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ABSTRACT

A literature review was conducted in an effort to locate programs that could improve opportunities for learning for middle graders, and particularly educationally disadvantaged middle graders. Of the more than 200 programs that were reviewed, about 80 were identified as having promising components for middle grades educators. Section I discusses issues underlying the identification of such programs and common components of promising programs. Topics include high content, definition of disadvantaged students, prevention and treatment, and common components of recognition programs, including Chapter 1 and National Diffusion Network programs. Section II provides examples of promising programs and their components in the areas of mathematics, reading, writing and language arts, thinking skills, science, social studies, and combined components. Also discussed are issues raised by conflicting components. Section III considers recurring themes and conclusions. The report is expected to be especially useful to educators who are involved in program and staff development and evaluation or are making decisions about goals for students, gathering information on promising programs, or reviewing materials, costs, and evidence about effects. A total of 49 references are cited, and a directory of 77 programs is appended. (RH)

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THE JOHNS HOPKINS UNIVERSITY

Promising Practices In Major Academic Subjects In the Middle Grades

Joyce L. Epstein

and

Karen Clark Salinas

Report No. 4

May 1990

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The Center

The mission of the Center for Research on Effective Schooling for Disadvantaged Students (CDS) is to significantly improve the education of disadvantaged students at each level of schooling through new knowledge and practices produced by thorough scientific study and evaluation. The Center conducts its research in four program areas: The Early and Elementary Education Program, The Middle Grades and High Schools Program, the Language Minority Program, and the School, Family, and Community Connections Program.

The Early and Elementary Education Program

This program is working to develop, evaluate, and disseminate instructional programs capable of bringing disadvantaged students to high levels of achievement, particularly in the fundamental areas of reading, writing, and mathematics. The goal is to expand the range of effective alternatives which schools may use under Chapter 1 and other compensatory education funding and to study issues of direct relevance to federal, state, and local policy on education of disadvantaged students.

The Middle Grades and High Schools Program

This program is conducting research syntheses, survey analyses, and field studies in middle and high schools. The three types of projects move from basic research to useful practice. Syntheses compile and analyze existing knowledge about effective education of disadvantaged students. Survey analyses identify and describe current programs, practices, and trends in middle and high schools, and allow studies of their effects. Field studies are conducted in collaboration with school staffs to develop and evaluate effective programs and practices.

The Language Minority Program

This program represents a collaborative effort. The University of California at Santa Barbara is focusing on the education of Mexican-American students in California and Texas; studies of dropout among children of recent immigrants are being conducted in San Diego and Miami by Johns Hopkins, and evaluations of learning strategies in schools serving Navajo, Cherokee, and Lumbee Indians are being conducted by the University of Northern Arizona. The goal of the program is to identify, develop, and evaluate effective programs for disadvantaged Hispanic, American Indian, Southeast Asian, and other language minority children.

The School, Family, and Community Connections Program

This program is focusing on the key connections between schools and families and between schools and communities to build better educational programs for disadvantaged children and youth. Initial work is seeking to provide a research base concerning the most effective ways for schools to interact with and assist parents of disadvantaged students and interact with the community to produce effective community involvement.

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Abstract

Educators in the middle grades are searching for "promising programs" to improve the education of all students, and particularly of educationally disadvantaged students. In 1989, we canvassed the field for curricula that could help middle grades teachers and administrators improve all students' opportunities for learning. Over 200 programs were reviewed, including many recommended by the U.S. Department of Education's Program Effectiveness Panel (PEP), those recognized as effective Chapter 1 programs, and other programs described in journals, conferences, and informal publications.

The search focused on programs that bring high content to the major academic subjects for disadvantaged students in the middle grades. Promising programs either emphasize new access to existing high content or new high content. The programs offer learning opportunities that prevent learning problems from developing or that treat learning problems. Students may by expected to make average progress or accelerated progress in one year's time in programs that aim to be equally or more effective than others. Programs aim to teach basic skills faster and better, or to teach basic and advanced skills in ways that deepen students' thinking, understanding, and knowledge.

From the academic subject programs reviewed, we identified about 80 that had promising components for middle grades educators. None could be labeled "effective" because of serious measurement and evaluation problems. The programs include examples that look promising for improving math, reading, writing and language arts, thinking skills, science, and social studies in the middle grades. An Appendix identifies how to obtain more information on the programs.

The issues, measurement problems, and themes that underlie "promising programs" must be understood by educators who judge and select programs for their own schools, and the problems must be understood and corrected by researchers and program evaluators.

Introduction

Educators in the middle grades are searching for "promising programs" to improve the education of disadvantaged students. In 1989, researchers at The Johns Hopkins Center for Research on Elementary and Middle Schools (CREMS) canvassed the field to identify and examine programs that could help middle grades teachers and administrators improve the education of their disadvantaged students. The programs reviewed included those approved by the U.S. Department of Education Joint Dissemination Review Panel (JDRP, the Program Effectiveness Panel, or PEP) for support by the National Diffusion Network (NDN); programs recognized by the U.S. Department of Education as effective Chapter 1 programs; and other programs described in journals, conferences, and other publications. Only programs that responded to requests for information and that included evaluations of some kind were reviewed.

There are hundreds of "bright ideas" for new programs and practices in magazines, newsletters, and conference programs for educators around the country. Some descriptions make the practices sound like selections for the "miracle of the month club." However, few middle grades programs have been evaluated rigorously enough for educators to know for sure whether the programs are "effective" -- thus schools must make choices of programs without the benefit of full or final evaluations. Although most programs discussed in this report have not been fully evaluated and cannot be labeled "effective," each has at least one component that holds promise for improving the education of disadvantaged students in the middle grades.

There are no shortcuts in making decisions about which programs to adopt, adapt, or develop. Middle grades educators must (1) decide on their goals for all students, including disadvantaged students; (2) gather information on promising programs that could help them reach their goals; (3) review materials, costs, and evidence about effects; (4) select, synthesize, adapt, or design programs, materials, and activities; (5) provide necessary staff development so that teachers and supervisors can implement the programs successfully; and (6) evaluate the effects of the programs in their own schools.

It takes at least a year to plan, collect, review, select and develop materials, and provide staff development to initiate a program. Committees of supervisors, teachers, and others might review several promising programs for a particular subject to better understand the components that are more likely to increase the skills and understanding of disadvantaged students. Committee members would discuss the pros and cons of different programs with each other and with other school staff to decide whether to pick one program or combine components from several programs to meet the needs of the students in their school. Which content? materials? activities? management systems? organizational structures? or other practices are needed?

A second year will be needed to implement a program and conduct preliminary evaluations; and a third year will be needed to more rigorously evaluate the effects of a program on all students and important subgroups of students. These activities may be speeded up a bit if programs are adopted rather than adapted, or if staff development is highly efficient and supervision is highly effective. The process may be slowed if programs need to be extensively tailored to the needs of a particular district, school, or population of students or if new materials and activities need to be developed.

This report should assist educators with all six of the above steps, but most extensively with steps one, two and three -- deciding on goals, gathering information, and reviewing evidence. The report should be helpful in program development, staff development, and evaluation, especially in identifying weaknesses to be avoided in these areas, but program improvement is a site-based process that requires important investments of time and considerable trial and error.

The first section of this report discusses important issues underlying the identification of promising programs for disadvantaged students in the middle grades and common components of

promising programs. The second section provides examples of promising programs and their components. The third section discusses recurring themes and conclusions. The Appendix is a directory of programs.

I. Issues to Consider

The search for promising programs focused on those that bring high content to the major academic subjects for disadvantaged students in the middle grades. The programs may offer learning opportunities that prevent problems from developing or that treat learning problems. Students may be expected to make average progress or accelerated progress over one year's time in programs that aim to be equally or more effective than others.

High Content

The Edna McConnell Clark Foundation identifies High Content, High Support, and High Expectations as three goals of education for disadvantaged students in the middle grades. In this report we focus on programs that emphasize the quality and quantity of content in the major academic subjects.

High content programs for disadvantaged students either emphasize new access or new content. New Access programs aim for full and more equitable access to the high content that is already part of school programs. This means that high content curricula and courses will be available to all students, that the high content in texts and other materials will be used fully with all students, and that the same content may be taught to and learned by different students in different ways.

Some programs that stress new access to high content seek to provide all students with the curricula that previously was reserved for the best and the brightest students. In these schools, decisions concern how to offer courses and experiences to all students instead of some students. For example, in many middle grades schools only some students have access to pre-algebra or algebra, foreign language, keyboarding or computer use, literature, or other subjects (Becker, 1990; Epstein, & Mac Iver, 1989b; Mac Iver, & Epstein, 1989).

Other new access programs focus on better and fuller use of existing textbooks and instructional materials. Texts and materials vary in the extent to which they stress higher level thinking skills and other high content. And teachers vary in the extent to which they use these sections of the texts with the best students and with disadvantaged students. In most schools, there are already many opportunities and resources for high content in texts and supplementary materials, but access to them is closed or limited because teachers do not make full use of these activities or introduce these sections of the text to some students only.

Still other programs improve disadvantaged students' access to high content by offering new ways of learning the existing content. When the curriculum is already challenging, but disadvantaged students fail to learn, teachers must find new instructional approaches to assist learning. Most Chapter 1 and other remedial programs set this goal for improving equity in students' access to high content. The programs use diverse teaching approaches and instructional materials to help students master skills they have missed.

From existing resources, all schools can improve the access to an education of high content for all students, including disadvantaged students.

New Content programs aim to change or add content to the existing curricula for all students or for disadvantaged students in particular. New content is selected to increase or revise what students learn, to improve the types of learning activities that students do, and to raise the levels of students' thinking and competence.

For example, schools add new content to develop students' higher level thinking skills or critical or creative thinking. This addition to the existing curriculum is based on the beliefs that all students can learn, that all students can be taught

to think better, and that all students need to be challenged with well designed, mind-stretching activities at all levels of learning.

New content may refer to more relevant courses -- courses that add meaning and importance to school. Career explorations and character education courses that enable middle grades students to expand their views of themselves as students, workers, and members of society are examples of new content added to existing curricula. New content also may refer to courses that expand a curriculum, such as anthropology, statistics, multicultural studies, or other topics appropriate for the middle grades that become required or elective full courses or mini-exploratory courses that were not part of the regular curriculum.

New content in the middle grades is sometimes old content adapted from high schools, as when Latin is added to the foreign language requirements, algebra or geometry are offered as math courses, or an experience with Shakespeare is added to the English program. Sometimes new content in the middle grades gives students high school credit (e.g., in math or foreign language), much as Advanced Placement (AP) courses give high school students a head start on college courses.

New content also may be added to increase students' active participation in learning. This approach requires teachers to add or revise curricula to stress active learning rather than passive listening, or to add new forms of demonstrations, projects, and group presentations to the traditional paper and pencil tests for students to show their acquisition and application of knowledge. This approach de-emphasizes the "coverage" of content by the teacher in return for a deeper investment in content from teachers and students. Indeed, progress in units of work that stress active learning may be slower than progress in regular lessons, but students' interest, attention, and motivation may be higher and understanding may be deeper.

Educators must decide not only <u>what</u> knowledge is needed in high content programs and who will have access to it, but also <u>whose</u> knowledge will be included in different subjects and why (Apple, 1990; Lieberman, 1990). "Whose knowledge" raises questions of how schools recognize the contributions of multiple cultures and important subgroup perspectives on and interpretations of the knowledge base in all subjects.

The expectation is that new content in thinking skills, new course topics, demanding and prestigious courses, active learning, and diverse perspectives will make more students more interested, engaged in, and committed to their school work. They will understand its relevance to present and future goals; they will come to school, invest in learning, assume the role of "student," and stay in school.

New access and new content both are part of a never-ending program of curriculum development and school improvement. Of course, new content in one school may be existing content in the next. Some schools already offer advanced or unique classes to some students but not others (such as algebra, foreign language, creative thinking, career exploration, or others), while other schools do not yet offer these courses to any students. If new content is not added equitably, then new access becomes an important issue.

The word most often associated with high content is "challenge." Whether a program is providing new access or new content, high content is challenging, important, and motivating to the students, and extends basic and advanced skills and abilities. Some wonder whether it is enough to focus only on new access to high content to assure more efficient and equitable delivery of existing high content to all students instead of only the best students. Is it enough to help teachers fully utilize the existing high content activities in their texts, manuals, and supplementary materials that are presently unexplored and unutilized with all students, or used only with the best students? Or, is it necessary to go beyond the texts and beyond present curricula to create new content education for all students? For most middle grades schools, new content is needed in advanced thinking skills, computer-based instruction, interdisciplinary units of work, calculators and other technology in math and other subjects. Other types of new content are illustrated in many of the promising programs reviewed in this paper.

The goal of some high content programs is to accelerate students' learning, and the content is "high" because it requires quicker-than-average mastery of skills, even by students who were far below average in their skills. The goal of other high content programs is to deepen students' learning, and the content is "high" because it requires new ways of reflecting on profound questions, essential distinctions, causes and effects, different perspectives and viewpoints (Lewis, 1989).

The promising programs reviewed here should help schools develop "high content" curricula for disadvantaged students in two ways -- by providing new access to existing high content to all students or by adding new content to raise the quality of the curriculum for all students. New access and new content programs must be equitable, with all students having access to the curriculum, and all curricula must be challenging, with all students working hard to move from their present to more advanced levels of understanding, knowledge, and applications.

Defining "Disadvantaged" Students

Schools identify disadvantaged students or students who are at risk of failing in many ways. Some programs identify students who are older than average for their grade level -- an indicator that the students were retained to repeat a grade sometime during their school years. Others identify students who fail two or more courses on the most recent report card, or who are far below grade level in reading or math work in class. Most often, however, programs identify disadvantaged students on the basis of test scores -- e.g., students who are in the lowest quartile or in the lowest 40th percentile on a nationally normed standardized test. Some schools use achievement test scores only, whereas others use many criteria for eligibility including report card grades, retention, teacher observations, and others.

Even when they use the same criterion to identify the "disadvantaged" (e.g., standardized test scores), schools set different limits for selecting students to receive Chapter 1 or other remedial services. Some include all students who score at or below the 40th percentile, others offer services only to those below the 25th percentile on a standardized achievement test.

A process of "educational triage" is used to place students who are at risk of failing in the order of greatest need. Most schools do not have enough resources for all who qualify. Thus, many students who need assistance do not receive it, particularly those who are marginally disadvantaged.

Chapter 1 funds and other special services often are limited in the upper grades, due to decisions by school leaders to emphasize remedial instruction in the early grades. This usually means that upper-grades students must be further behind grade level and have more serious learning problems to qualify for extra help. For example, in one Chapter 1 program, second grade students are eligible for services if they are three months behind grade level in skills, but sixth grade students must be 1.5 years behind grade level. Most Chapter 1 programs report that older students make less progress than younger students (Kennedy, Birman, & Demaline, 1986; Winfield, 1986), and students who need more help make less progress in one year's time than do students who need less help (Carter, 1984). Some programs vary from the typical pattern and report dramatic gains for students in the upper grades, suggesting that the quality of teachers, the quality of materials, the level of innovation, and characteristics and needs of particular students determine the success of programs.

Because of limited resources, students at any grade level may "test out" of a program before they are out of danger of failing and before they attain grade level skills. Regular classroom teachers may or may not be able to assist these students, depending on how much help they need and how many students need help.

At all grade levels, and especially in the upper grades, students selected for special services are those who have the most serious learning problems. These students need highly innovative instruction and support. Presently, most Chapter 1 programs and other special services are not innovative enough, intensive enough, or well organized enough to do the job they need to do with disadvantaged students.

Different definitions of "disadvantage" and different approaches to educational triage make it difficult to compare programs. Programs need to clearly describe how they identify and select disadvantaged students for services in order for other schools to judge how programs work in schools that are similar to their own.

The Middle Grades

This review includes descriptions of promising programs for students in grades 5-8, whether the programs are conducted in elementary, middle, junior high, or other school buildings. More programs focus on disadvantaged students in elementary schools that include grades 5 and 6. Programs for fifth and sixth graders that are part of a sequence across the elementary grades differ from programs that serve early adolescents only. Some components of elementary school programs can be adapted to grades 5-9 in middle schools, junior highs, or other grade organizations.

As we reviewed programs, we looked for features that were sensitive to the characteristics and needs of young adolescents (California State Department of Education, 1987; Carnegie Task Force on the Education of Young Adolescents, 1989; Dorman, 1984; Lipsitz, 1980; 1984; Maryland State Department of Education, 1990). Promising programs for educationally disadvantaged learners take into account the simultaneous and often conflicting needs of early adolescents. For example, promising programs to promote high content in academic subjects find ways to balance student needs for individual attention with their needs for social support and acceptance by peers; or student needs for independence and increasing autonomy with their needs for strong and responsive guidance; or student needs to feel competent with their needs for exploration and discovery.

Prevention or Treatment

Middle grades schools face some important choices about how to improve programs to prevent students from becoming "disadvantaged" or to treat students who have learning problems.

Some programs and practices aim to prevent problems by raising the level of content and improving the performance of all students, including disadvantaged students. For example, reading programs that require all students to read daily, write about what they read, and report their ideas from their reading, aim to help all students improve their reading, writing, and speaking skills, regardless of their initial reading level. When good programs are working to prevent learning problems, all students are expected to make at least one year of progress in one school year. Procedures to help students correct minor problems are built into the regular instructional process of prevention programs.

Other programs aim to treat problems to correct, increase, or accelerate the learning of students who have fallen behind grade level in their skills. This strategy targets only the students who need extra help and provides them with remedial instruction. Assistance may be offered to students in their regular classes; or by pulling students out of regular classes during class time; or by providing extra classes for students before or after school, in the summer, or on Saturdays.

Many promising treatment approaches allow students to improve their skills from their own starting points. Successful treatment programs aim to help students who have fallen behind grade level catch up with their peers. This assumes that more than one year's progress can be made in one year's time by students who have previously learned at slower than average rates. This is a tall order that demands extraordinary schooling and extraordinary learning. Many treatment programs provide extra staff, materials, instruction, attention, and other resources that students need to "catch up" to grade level.

Comprehensive programs in schools need to include both prevention practices to keep students from developing serious problems and treatment practices to help students who, despite best intentions, develop serious learning problems. An important question is "What programs or practices provide the most effective prevention and treatment strategies to boost, maintain, or correct students' skills with challenging, exciting, and supportive activities?"

Identifying programs that are equally or more effective. Some prevention and some treatment programs aim to be as effective as regular programs. Students are expected to make the same amount of progress as in a regular program (i.e., one year's growth in one year's time). These programs provide educators with alternative programs for students who do not respond to instruction as it is typically organized. Other programs aim to be more effective than regular programs to help students make more-than-expected progress or to accelerate learning (i.e. more than one year's growth in one year's time). This is still mainly an elusive dream. Few evaluated programs demonstrate consistently that they help students make up lost ground.

Common Components of Promising Programs

Promising programs across subjects share some common features. This section discusses components that recur with enough frequency that they deserve careful consideration by educators. Different schools will select or design programs to emphasize different features, depending on the schools' goals and the specific needs of students.

Coordination of regular classes with supplementary or pull-out classes. Many programs make special efforts to enable regular and special or resource teachers to work together frequently and in purposeful ways to improve the quality of instruction for students who need extra help. When regular and remedial teachers coordinate lessons, remedial instruction is based on the skills that students need in order to succeed in their regular classes. When regular and remedial teachers work together in the same classroom, students do not lose instructional time or exposure to high content curricula by being pulled out of regular classes. The goal, overall, is for students to master the skills they need in the shortest possible time. For such coordination to occur, principals must give teachers adequate planning time, with some common planning time for regular and resource teachers who teach the same children to talk and work together.

Individualized instruction is featured in many promising programs to assure that students receive instruction in the skills they need, rather than spending time on skills they already know. If materials for individualized instruction are not available, then individualized attention is provided in small group instruction for students who need help with the same skills. Promising academic programs get as close as possible to the students' individual needs to provide pertinent instruction.

Many programs that provide extra help to disadvantaged students specify four features to help teachers organize and individualize or personalize instruction:

- Diagnosis of students' starting skills to identify which students need extra help and on what skills.
- Prescription of a sequence of instruction on needed skills.
- Instruction to help students learn the skills, including varied teaching methods and materials.
- Evaluation of student success and readiness to move on to the next needed skills.

Many programs that diagnose, prescribe, instruct, and evaluate students have weak links between prescription and instruction and between instruction and evaluation. These connections must be innovative, effective, and continued until students actually master the skills satisfactorily. Most programs do not assure that the sequence of four steps for individualized instruction is successfully completed. These four features may be organized in management systems for teachers and for students.

Efficient and comprehensive management systems. Many promising programs include elaborate paper or computer-based management systems (especially in math and reading) that help teachers identify students who need help, organize instruction, and monitor student progress. The management systems set up a complete array of all skills required in a subject and then help teachers account for each student's progress on each skill.

Paper systems for tracking students' skills and progress may be considered excessive if reams of paper are needed to monitor a class (e.g., 30 students x 150 skills x 2 quizzes or tests per skill x 2 teaching methods or learning materials requires 18,000 pieces of information.) Computer-based systems help control this flow of information, but not all computer systems are "teacher friendly." For management systems to work, educators need to review alternative systems to find those that will best meet their needs. Then the staff development must be provided to help teachers implement and use new record keeping techniques comfortably, quickly, and fully. Whether computer-based or paper-based, good management systems assist teachers to be more organized in their work, much as medical management systems help doctors diagnose, prescribe, administer, and monitor patients' symptoms, treatments, and progress.

Of course, students with low skills and test scores need more than better management systems. They require more and different curricula, alternative instructional approaches, and a variety of materials. Management systems are important but not sufficient components of many promising programs.

Groups with temporary membership. Grouping is an instructional tool that teachers must use in regular and remedial classes to provide efficient and effective instruction to students who need to learn and work on the same skills. In many promising programs, group memberships are flexible and temporary for particular instructional activities, not fixed or permanent in ways that "track" or label students in negative terms.

Attention to different styles of learning. Some promising programs are responsive to students' "learning styles." This is an appealing concept that asserts that children learn in different ways, with some preferring visual, auditory, tactile, or kinesthetic methods (Dunn, Dunn, & Price, 1989).

Most programs cannot and should not provide a complete curriculum based only on one style. Presently, measures to assess "learning styles" are suggestive, at best. Instructional materials that accompany programs in most academic subjects for auditory, tactile, and kinesthetic learning are very thin. Middle grades students' learning styles are in flux as they develop new ways of thinking and learning. Labeling a "preferred style" at one time as a characteristic of a student is limiting at best, and dangerous at worst. Promising programs for students who need extra help in the middle grades use a variety of visual, auditory, and manipulative materials to teach and reinforce skills, but do not pigeonhole students in a single or fixed "learning style." Promising programs also provide a mix of opportunities for students to work with peers and to conduct individual projects to help them learn how to work cooperatively, competitively, and intensively.

Students who fall behind often will learn a skill if it is taught a new way from the first time they tried and failed to learn it. Although teachers cannot tailor all work to each child's preferred learning style, teachers should be able to draw upon visual, auditory, and manipulative methods to reteach math and other subjects in the middle grades to students who need extra help. Teachers of young children in elementary schools tend to do this as they teach for mastery.

In the middle grades, teachers do not typically teach for mastery, but aim to "cover" course content. They do not expect all students to master all skills. Rather, students are expected to fall somewhere on a normal curve -- with some students succeeding well, and some just passing, and others failing. Remedial instruction in the middle grades brings teachers back to a mastery model. Teachers who want to help students catch up in skills need to add to their repertoires alternative instructional strategies that encourage students to learn the same material in different ways.

Involving families in children's education. Promising programs across the middle grades involve parents in their children's education. This does not refer only to Chapter 1 Parent Advisory Council representatives or only to traditional occasions such as Open House events or PTA activities. Major emphases are on helping all parents to understand early adolescence and middle grades programs, and to become partners with teachers in encouraging children with their schoolwork, interacting with them at home to support school goals and

programs, and assisting children with decisions that affect their own and the families' futures.

Although some educators see families and community groups as separate from the schools and argue that it is not the school's responsibility to involve adults, others argue that schools must actively work to inform and involve families and others in the community in order to improve student success and to improve school programs (Comer, 1980; Epstein, 1987). Many promising programs include ambitious goals and practices to keep middle grades students' families informed and involved in their children's education, whereas most ordinary middle grades programs do not implement such practices and often ignore families.

Research shows that families need and want clear information about how to help their middle grades students on school skills and school decisions that affect the students' and families' futures (Dauber, & Epstein, 1989; Epstein, 1986). On a daily basis, families need to talk to middle grades students about school and specific subjects, how to monitor and guide homework, how to encourage better work, and how to enrich learning with other family experiences. This is important for all students, but especially for students who receive remedial instruction and who need positive messages about progress from as many sources of support as possible.

One promising practice is to have an "at-risk" specialist or school and family coordinator in each middle school whose only job is to assist students who are at risk of failing or who have other serious problems, to work with the families of these students, and to work with teachers and guidance counselors to help them understand how to establish productive connections with families (Earle, 1990).

Student responsibility for learning. Promising programs emphasize student participation and student responsibility for their own learning. When students are active participants in their own learning, teachers keep few "secrets" about the goals of programs, the requirements for success, alternative approaches for reaching goals, the meanings of evaluations, or other aspects of teaching and learning. Students are encouraged to keep logs or diaries to comment on their own work and to keep track of their own progress and experiences. Participation and responsibility take many forms, but in promising programs students are more often aware of their own active roles in schoolwork and success.

Extra staff and extra resources. Promising programs for disadvantaged students are beginning to search for and find new ways to allocate Chapter 1 and other available funds to obtain the extra personnel (teachers, aides), technology (computers, calculators), and other instructional materials that will help more students master required skills. In many programs highly qualified and certified teachers are assisted by aides, supervised by a Chapter 1 Director and/or assisted by other district level supervisors or lead teachers at school. This adds up to rather high-powered teams of supervisors, teachers, and aides working together to help students succeed. Several programs place extra teachers and aides directly in regular teachers' classrooms to create classroom-based teams of teachers to provide extra help to students on a daily basis.

Staff development may be the most critical common component of promising middle grades programs for disadvantaged students. Most of the programs reviewed in this paper provide appropriate and sometimes extensive staff development so that teachers are comfortable with and confident about implementing programs. Staff development may take two or three days, or up to 18 days or more; some programs provide follow-ups and continued guidance for teachers. Staff development should be as short and efficient as possible to help teachers, curriculum supervisors, and other administrators fully understand the programs they plan to implement, but as long as necessary to insure faithful and successful implementations.

Teachers need to learn new ways of thinking and talking about their subjects, new ways of conducting lessons, new ways of interacting with slower students who are working with high content curricula, new ways of managing their teaching and monitoring and rewarding students' learning. Teachers are going to make choices about new programs despite the absence of useful evaluations. The translation of

ideas to practice is going to take a more coordinated program of staff development than typically has been available for most middle grades educators (Epstein, Lockard, & Dauber, 1989a). Unless funds for adequate staff development are appropriated and adequate staff development is provided, promising programs will fail.

Recognition Programs

Two national recognition programs identify promising programs that offer high content education to disadvantaged students: the Chapter 1 Recognition Program rewards a school for designing and implementing its own program well; the Program Effectiveness Panel (PEP) approves programs for the National Diffusion Network (NDN) (Cotton, Griswald, & Estes, 1988; National Dissemination Study Group, 1988). Many programs recognized by Chapter 1 and many included in the NDN are described in later sections of this paper. In this section, we discuss a few issues raised by the procedures underlying the criteria for recognition. Although programs receive a "stamp of approval" from these two national recognitions, educators cannot simply adopt these programs without carefully considering the strengths and weaknesses of the programs, the adequacy of their evaluations, and the appropriateness of the programs for the students in their own schools.

Recognition of Chapter 1 Programs

When most educators think of "disadvantaged" students, they think first of Chapter 1. Chapter 1 programs are recognized by the U.S. Department of Education's "Initiative to Improve the Education of Disadvantaged Children." Schools seeking recognition must submit a formidable application to explain the program's goals and objectives, coordination among teachers, parent and community involvement, professional development and training, leadership, instructional materials, methods, approaches, expectations for student learning and behavior, school and classroom climate, use of academic learning time, recognition and rewards for students, and evaluation results. The required topics help schools organize the description of their programs, and these descriptions may assist other schools to replicate or adapt ideas. Most schools, however -- even those receiving recognition -- describe their programs in rather mundane terms. Most are pull-out or supplemental programs; few have highly innovative components or curricula; many are strong on one criterion but weak on others.

One of the key features of the Chapter 1 recognition program is that Federal regulations require all schools to report student scores and progress on achievement tests in Normal Curve Equivalents (NCE) because of the equal interval nature of that measure. NCE's are normalized standard scores that correspond to percentiles. Chapter 1 programs report NCE pre- and post-test scores, gain scores, and long-term gains. This should allow meaningful comparisons of students' progress across schools, districts, and states, and should help educators compare and judge the effectiveness of programs. Any gain from pre-test to post-test is considered a measure of progress, although many educators who judge promising programs tend to consider an increase of 7 NCE points or more as educationally important. This, however, is an arbitrary guideline.

Schools that feel confident enough to submit their program for review probably have more organized and stronger programs than average. Indeed, the recognized programs tend to report higher NCE gains -- sometimes twice as high -- than other schools in their district, state, or in the nation. However, there are many problems with how the scores are collected, compared, and reported across programs. Problems abound in the timing of tests, accuracy of reports, subgroup and subtest differences, comparisons, and lasting results on scores and gains. Consequently, most Chapter 1 evaluations based on NCE scores cannot help educators identify unambiguously effective programs.

Timing of tests. Until recently, many schools reported only fall-to-spring NCE "gains." These are somewhat deceptive

indicators of student progress, particularly over time. For example, many students' test scores decline from spring to fall because they forget information over the summer. Then scores climb again by spring as students progress through the school year. The pattern of forgetting and learning yields dramatic fall-to-spring "gains" but little spring-to-spring progress. That is, NCE gains are clear from fall to spring, but the pre-test scores on which they are based are artificially low in the fall, and the post-test scores do not change much from one spring to the next. Progress is made each year, but does not accumulate over time to bring students up to higher scores. Different questions can be answered with fall-to-spring, spring-to-spring, and fall-to-fall scores, but comparisons cannot be made across programs reporting gains over different intervals.

Some of these problems should change because all Chapter 1 programs are now required to report spring-to-spring NCE scores and gains. This should make it possible to more successfully compare programs.

Accuracy of reports. Districts sometimes report state or national scores for the same year inaccurately. For example, one district (in North Carolina) reported national NCE gain scores for 1985-86 in reading as 3.7 and 3.4 for grades 5 and 6, respectively. Another district (in Virginia) lists the same national figures as 6.6 and 5.8, respectively. If the first district used the national gains reported by the second district, the first district would not have been able to claim that its program produced results above the national average.

Subgroup differences. Another problem in judging program effectiveness results from districts' practices of reporting only combined or average scores for very different schools that participate in their Chapter 1 programs, for grade levels within and between schools, and for subgroups of students. Schools within districts vary greatly in the number of low-ability students they serve, ranging from few or none up to 100% of the students. NCE scores that are reported as an "average for the district" may reflect successes in some schools and failures in others. Only a few Chapter 1 programs report scores separately for each school and grade level.

The number of students who qualify for Chapter 1 services creates a school climate for learning that can affect the success of programs and students in different schools (Stringfield, & Davis, 1987). It may be that schools with just a few disadvantaged students can assist them more quickly and more successfully than schools with total populations of at-risk students. On the other hand, schools with all or most disadvantaged students can organize school-wide Chapter 1 projects that dramatically restructure education to help all students succeed.

Within schools, students starting at different skill levels may take different lengths of time to make measurable progress. Most programs do not provide information on subgroups of students with different starting scores. A few programs report results in terms of the per cent of students who gain different amounts over one year (e.g., 30% gain over 10 NCE, 20% gain from 5 to 10 NCE, 20% lose over 5 NCE points, and so on). Distributions like this can help educators decide whether the program is equally effective for all students or whether to revise the program to reduce losses and increase gains.

Other student characteristics also may affect which students make expected or unusual progress. Are boys and girls equally affected? all racial groups? When programs report "averages" without examining and reporting subgroup differences, schools cannot identify which procedures in their own programs need to be changed to meet the needs of different groups of students, nor can potential users know whether the programs work successfully in schools with students most like their own.

Different tests and subtests. Scores and gains need to be reported on specific subject tests or subtests. For example, a reading comprehension program should improve reading comprehension scores but may not affect overall reading achievement scores. A math computation program should first affect students' basic math skills but may not have short-term results on math problem-solving. A writing program should improve writing skills before it has an impact on reading or other achievements. Many programs inappropriately use the same scores to judge the effectiveness of different programs and practices.

Although all Chapter 1 recognition applications include achievement test results, few programs include other measures of achievement such as criterion-referenced tests, report card grades, honor roll memberships, or student demonstrations of abilities. Few programs measure and report other important outcomes such as attendance, promotion rates, courses completed, informal assessments from students and families about the students' work and progress, homework completion, class participation, school completion or graduation rates, disciplinary actions, and other outcomes that may be program goals and that are encouraged in the Federal regulations for Chapter 1.

Educators not only need to build appropriate evaluations and expectations into their own programs, but also should demand this information in reports or materials that describe or advertise promising programs. Results by school, grade, and student subgroups and results for subtests and specific subjects should be required to determine whether programs are consistently successful. If the necessary subgroup, subtest, and comparison group scores and gains were provided, it would be easier to identify particularly effective programs for schools with particular populations of disadvantaged students.

Pre- and post-tests and comparisons. It is not enough to use only pre- and post-test gain scores to show that students improve as participants in a particular program. Scores go up for all students in most subjects over time, regardless of the program. Thus, it is necessary to have comparison groups whose pre- and post-test scores show what happens under clearly contrasting circumstances. This may be program treatment vs. control groups, or comparisons of multiple treatments, or other pertinent comparisons. For example, over several years WR.I.T.&E., an NDN program to increase students' writing skills, moved from studying pre- and post-test gain scores to studying treatment and control comparisons. Less rigorous studies may demonstrate that students are helped and not harmed by a particular program, but sooner or later, comparison classes are needed to learn whether new programs are better, equal, or worse than other programs for improving or accelerating student learning.

Lasting results. Sustained or lasting effects also must be carefully charted to indicate which Chapter 1 programs are really effective. Some programs report the average NCE gains over two or three years of students who remained in Chapter 1 programs. Often this number is too small -- fewer than 5 or 10 students in a school -- to provide a reliable picture of sustained effects. Other programs report the scores over time of students who were in Chapter 1 programs, but who returned to regular classes. Their progress reflects the work the students did during one or more years in Chapter 1 programs and their work in regular classes. Comparisons of sustained effects cannot be made on differently defined samples of students or too-small samples of students.

Moreover, sustained effects must be reviewed carefully. An average gain of 4.5 NCE points over three years of students who remain in Chapter 1 programs does not have the same meaning educationally as gains of about 4.5 NCE points for each of three years. If younger students made 13.5 NCE gain points the first year and no gains thereafter, educators would have important information about the need to improve the programs for older students.

The problems of identifying successful programs, however, go even deeper than how gain scores or sustained effects are measured or reported. Scores and gains are important, but some districts report only gains. Most students who are offered Chapter 1 services have very low NCE scores, and even consistent gains are not enough to help them reach and maintain grade level skills. If students' NCE scores are low -- e.g., in the teens, twenties, or thirties -- the gains made in most promising programs are not large enough for a long enough time to have important effects on the students' educational improvement.

Almost every Chapter 1 program recognized by the U.S. Department of Education states its assumption that "all students can learn" and that with effective supplementary assistance, disadvantaged students can be helped to meet the achievement levels of non-Chapter 1 peers. Data are not available, however, that demonstrate that programs reach this goal. Studies are needed that follow students over many years to determine which components of Chapter 1 programs help students catch up to the scores of their non-

Chapter 1 peers. In the future, Chapter 1 programs will need to be more innovative in order to actually accelerate students' learning.

Recognition of NDN Programs

The U.S. Department of Education's Program Effectiveness Panel -- PEP (formerly called the Joint Dissemination Review Panel or JDRP) evaluates and approves programs that it considers "exemplary." Developer/Demonstration Projects that receive PEP approval are eligible for dissemination through the National Diffusion Network (NDN). These programs tend to be thoughtfully developed "package deals" that provide staff training, materials for teachers and students, and follow-up activities and supervision after the program has been implemented.

NDN programs not only offer materials and training, but also make demands on the schools or districts that adopt programs. This usually includes a signed contract for staff development, fees for the training team, release time for the teachers who will learn about the program, and the assignment of a local facilitator or coordinator at the district level to help teachers implement the program after the staff development occurs. Sometimes school level leadership also is assigned. The adopting sites must permit evaluations of the programs and maintain a demonstration school or classroom where visitors are welcome to observe the program. These requirements are more than symbolic. Districts that invest in a program are more likely to take the implementation and conduct of the program seriously.

Most NDN programs are approved because they are supposed to improve education for all students. A few are designed specifically for disadvantaged students. There are, however, many problems with the consistency of the quality of the programs in NDN and their evaluations. The quality of materials and prototype activities that are sent in information packets range from poor to excellent. Some programs cryptically report that they are used in so many "states" or "districts," when they are really used in one or a few schools in those states or districts. Most of the evaluations of NDN programs are well-meaning but inadequate. They suffer from the same problems described in the previous section on Chapter 1 program evaluations. For example, few compare treatment and control groups.

Despite the importance of having programs "ready to go" that schools can select to help them meet specific goals, the NDN programs are of mixed quality with mainly mysterious messages of effects. Educators must carefully consider the programs and their components, the necessary staff development, the costs, the requirements, and the reported benefits for students like those they teach.

Only about 1 in 10 NDN approved programs are submitted to the PEP for recertification after 4 years. This means that even ambitious and extensive programs are often short-lived. Project directors move or leave their jobs, or supervisors and administrators change. The collection of PEP approved programs remains a relatively fluid set of "bright ideas" that include programs ready for implementation or ideas that can be adapted for the needs of particular schools and students.

Summary. Programs disseminated by the National Diffusion Network (NDN) and those recommended as effective Chapter 1 programs vary widely in quality, but tend to be better organized than other programs and are more likely to closely monitor student progress.

Educators cannot, however, rely solely on the programs that are given "stamps of approval." Many evaluations are incomplete or inaccurate. Although some programs report "significant" effects, they are not always "educationally important." Program developers often state that a program will be useful at other or all grade levels despite the fact that the program was originally designed for particular grade levels. Some programs for the elementary grades can be adapted easily for use in the middle grades, but others depend on key school organizational features or appeal to particular characteristics of students that are appropriate for particular grade levels.

These problems do not apply only to Chapter 1 or NDN programs. The descriptions and results of other promising programs that are not submitted to the national recognition

programs are often suspect in the same ways. The situation is very much one of "let the buyer beware!" Educators who review Chapter 1, NDN, or other promising programs must consider whether and how the practices and results are clear, credible, and generalizable. There is great, even desperate, need in the middle grades to identify well documented and evaluated programs and practices that will help students who are below grade level to catch up quickly and permanently.

II. Promising Programs

This section summarizes the results of our search for promising programs that add high content to the curriculum for disadvantaged students in the middle grades in math, reading, writing and language arts, thinking skills, science, and social studies. Because few, if any, programs have been adequately evaluated, our mention of programs cannot be interpreted as recommendations. Rather, the programs include some features that look promising for helping disadvantaged students succeed, move toward grade level, or feel challenged by high content. Although most programs are discussed in terms of one illustrative component, they may contain many other parts. When several promising programs include the same curricular, instructional, or organizational features, these components become noteworthy and may help middle grades educators develop programs of "high content" in their own schools.

The Appendix to this report is a directory to enable educators to obtain more information about the featured programs. The list in the Appendix is organized by subject and provides the title of programs alphabetically, contact person or reference, grade levels, whether the program has received Chapter 1 or PEP recognition, and whether it was designed specifically for disadvantaged students. Other resources and background materials are in the References to this paper.

There are, undoubtedly, many programs that we missed that have similar promising components, and others are being developed every day. The programs and components discussed here are illustrative of those that middle grades educators will find in their efforts to locate, choose, adopt, or adapt higher content learning opportunities for all students and especially for disadvantaged students.

It is amusing to look across programs to see three types of titles. Some names of programs are designed to be inspirational to students. These include such acronyms as Project REACH, IPASS, Operation Uplift, HOTS, FAST, T.E.A.M., and others.

Other programs are named to be intellectually appealing to teachers. These include such titles as Systematic Teaching and Measuring Mathematics, Team Accelerated Instruction, Individualized Prescriptive Instructional Management System, Structured Teaching in the Area of Reading, Calculator Assisted Mathematics for Everyday Living, and others. These programs' acronyms may or may not have meaning, but the titles are seriously pedagogical.

A third group of programs have generic and unemotional titles that are not designed to appeal to anyone in particular! These may be consciously inconspicuous, part of a larger effort, and named to convey the feeling of "business as usual." Examples include Chapter 1 Reading and Mathematics, Math Achievement Program, Andover's Integrated Reading System, and others.

There is, of course, nothing to suggest that programs are more or less effective because of their titles. Many titles, however, indicate the goals of programs and may alert educators to programs that fit particular philosophies and approaches.

Math: Promising Programs for the Middle Grades

In the middle grades, math teachers worry about the best ways to help students build a strong foundation in mathematics; the best ways to help students learn the skills they don't yet have; the best ways to move from arithmetic to algebra; and most of all, the best ways to make math make sense to their students.

In math (as in most other subjects), most schools and districts will continue to base their instruction on textbooks. Math textbooks, in particular, are familiar and easy to use, as students and teachers have followed the same format since the earliest elementary grades. Some mathematics texts have taken notable steps toward high content math skills and activities -- e.g., Real Math Grades 7 - 8 (Open Court, 1990). Although we are not reviewing or comparing textbook series, math educators should be ready to carefully compare texts on whether or how they include high content. The National Council of Teachers of Mathematics recommends topics that may be considered the new basic high content for all students. These include problem-solving, estimation, patterns, statistics and probability, measurement, real-world applications, and interdisciplinary connections of math with other subjects.

In this section we discuss the components of a few programs that seem promising for improving the math experiences of all students, and that may be particularly useful for developing high content math programs for disadvantaged students. Many of the promising math approaches for the middle grades add "supplementary" materials to enrich and enliven textbooks. A few provide full alternative programs, new texts, or texts in alternative forms, such as computer-based instruction or individualized programs.

Math Management Systems

Several programs feature management systems based on the scope and sequence of math skills. Although almost every teacher's textbook manual and district curriculum guide outlines a comprehensive scope and sequence for math skills, most manuals do not provide a workable management system for teachers to closely and easily monitor student progress. Thus, teachers need to consider supplementary math computer software or paper forms.

Management systems outline an "array" of required skills in a particular subject across one or more grade levels. Sometimes the skills are cross-referenced with several major texts so that teachers can use the systems with any common textbook series or can draw from multiple texts to help students learn the skills. Some management systems also cross-reference quizzes and tests, teaching approaches and materials, and other supplementary activities. Teachers can use these programs to organize their teaching and chart students' work and progress on each skill. There are several examples of promising math management systems.

Conceptually Oriented Math Program (COMP) is a paper-based management system that helps teachers diagnose students' needs and cross-reference math materials that can used to teach different skills. It includes a teacher guidebook, student activity book, awareness materials, tests, profile sheets, and other items. The math content is linked to that of eight common math textbooks. Evaluations are needed of the effects on student learning of this teaching tool.

Individualized Prescriptive Arithmetic Skills System (IPASS) is a computer-based program that helps teachers and students keep track of over 150 skills for grades 1 - 8. Teachers and students share responsibility for monitoring progress and continuing work. Evaluations show mixed results with some modest and some strong progress by students in IPASS on achievement test scores.

Systematic Teaching and Measuring Mathematics (STAMM) provides a sequential K-12 program covering hundreds of objectives, manipulatives, alternative assessment strategies, materials and resources for teaching, and other related information. The management system is designed as a computer-based or paper guide for teachers to monitor all important math skills. An early evaluation of STAMM (1984) reported the number of middle

grades students who mastered at least 70% of the math objectives. Most students attained that level of mastery, although other test results were not very clear. In theory, a comprehensive K-12 math outline should help teachers individualize students' programs from any starting point on the array of skills.

Summary. Although the evaluations of these management systems leave much to be desired, the programs represent a considerable amount of work by thoughtful math educators. They could help math teachers and supervisors to understand similarities and differences in management systems and to select, design, or adapt management systems for their own curricula. Math management systems make a persuasive case for keeping close tabs on what students know and need to know in order to help students make greater gains on all math skills.

Individualized Math and Peer Support

Team Accelerated Instruction (TAI) is an individualized program in which students are assigned to small heterogeneous teams to reduce the isolation that occurs in some individualized programs. Students move forward from their own starting places in math without being separated from students who differ in ability. TAI materials include worksheets, quizzes, and tests from basic elementary math skills through an introduction to algebra to meet the wide range of abilities and rates of progress typical in math classes. The process, then, can be used in heterogeneous classes. In TAI, teachers instruct small groups to introduce new skills and facilitate individual learning at all times. Students manage and monitor their own progress. They are rewarded by the teacher for individual and for team progress, regardless of their starting places. Evaluations of TAI in elementary school grades 3-6 indicate that students using TAI gain significantly more in math achievement, have more positive attitudes toward math, and better classroom behavior than do students in control groups.

Similar evaluations are needed in the middle grades. The available materials may be more appropriate for remedial instruction in the middle grades if many students are near or beyond the most advanced skills in the TAI kit. Or, middle grades teachers who like the TAI concept may be able to design extra materials up to or beyond a full year of high school algebra or geometry to cover the broad range of skills of students in grades 6-8.

Math Pull-Out or Pull-In Approaches

Traditional pull-out programs may be easier to organize in elementary schools than in middle schools or junior highs. In elementary schools, students may leave a class, go to a Chapter 1 or resource room for remedial instruction, and return to class relatively unobtrusively. In most middle or junior high schools, leaving and returning to class can be obvious, embarrassing, and often disruptive for the student, teacher, and other students. For example, the **Mathematics Achievement Program (MAP)** is a basic skills program designed for elementary school grades 2-5. It provides small groups of students with 30 minutes of remedial math instruction in separate classes. Although this program appears well organized as a pull-out program in the elementary grades, it would be difficult to duplicate in middle schools or junior highs. If students are pulled out of regular classes, the regular and remedial teachers and the students need to monitor what information was missed in the regular class, how homework will be completed, and how instruction is coordinated between the regular and remedial teachers. When middle grades students follow 40-55 minute periods, it is not easy to leave a class for 30 minutes and return without missing important information and experiences.

More promising for the middle grades are extra periods for remedial instruction during the school day. For example, in **Teaching Everyone About Math (T.E.A.M.)**, small groups of sixth graders (here, in an elementary school) meet for 45 minutes three times each week in an extra academic period. T.E.A.M. focuses on helping students master math skills in the last year of elementary school to increase the students' chances of success in math in seventh grade in a new school. The principal personally calls the families of each of the students to explain the program and to provide weekly

progress reports. The Chapter 1 teacher, regular teacher, parent, and student meet every six weeks to evaluate and discuss progress. Parents are helped to understand the program and to encourage their children's math work at home. The program reports modest gains for a very small sample of students. Clearly, better evaluations are needed of the components of this or similar programs. Nevertheless, its organization (an extra class period) and its other components of family involvement are adaptable to the middle grades. The concept of an intensive transitional program also could be important for the last year in middle school before high school.

Two other programs also are based on extra math during the school day. In **Classmate 88**, a Chapter 1 program, elementary students in grades 4, 5, and 6 receive extra math instruction in an extra class period. The program includes 70 computer-based lessons that provide students with immediate scores and feedback. Other parts of the program emphasize calculators, puzzles, and a variety of math materials. The program reports modest but consistent fall-to-spring gains for upper elementary students. Its materials could be useful for remedial instruction in the middle grades.

Operation Uplift is an individualized supplemental math program providing extra math periods for students in grades 1-6 and extra help in class. All students receive supplemental instruction that is closely coordinated with regular classroom instruction from extra teachers and aides who work with the regular classroom teacher. The program for students in grades 5 and 6 can be adapted for the middle grades. Operation Uplift combines an extra class period with a comprehensive, computer-based management system. The program offers a Math Resource Guide that cross-references math skills with software, games, and other activities. One of the most difficult tasks for curriculum reform seems to be linking the skills students need with new instructional approaches. The Math Resource Guide may be useful to other teachers who want to plan similar approaches. The program evaluation data includes only a limited sample of sixth graders and so is not particularly useful for understanding the effects on middle grades students.

There are other variations in programs to provide students with extra or intensive instruction. **Traner Middle School Chapter 1 Lab** for grades 7 and 8 groups students by ability in math to eliminate the need to pull students out of class. Two teachers, one assistant, and one aide work with students on math problem-solving, geometry, statistical tables, and other skills in individualized, small group, and computer-assisted instruction using a variety of instructional approaches. The students attend the Traner Middle School Lab with their regular teacher on a two week rotation schedule. In this way, their regular math classes are supplemented by an enriched math program with extra staff every two weeks for two weeks. The evaluation of this program is one of the few that measured whether students who were assisted in the middle grades continued to take math classes in high school. The limited evaluation suggests that more Traner Middle School Lab students continued with math courses through the 10th grade, than did students in a comparison group.

Schools that assign Chapter 1 students to separate math classes in the middle grades need to carefully examine how these students are grouped for instruction during the rest of the day. Most educators agree that students in low-ability groups face severe self-esteem and motivation problems, created or exacerbated by the group assignment, and that students should not spend all day in classes grouped homogeneously by ability (Maryland Task Force on the Middle Learning Years, 1990), but few educators have figured out how to schedule students in some homogeneous and some heterogeneous classes so that they are not "tracked" by ability in all subjects, all day, all year, and every year.

Chapter 1 Mathematics Project (K-8) aims for the same goals as the Traner Middle School Chapter 1 Lab, but organizes extra teachers and help for students within heterogeneously grouped math classes. All students receive instruction as a whole group for part of the class time. Then, small groups work together and receive individual assistance from an extra remedial instruction teacher who works in the classroom with the regular teacher. A clear management system helps the two teachers organize, instruct, and monitor student progress

on math skills. The program evaluation shows rather consistent success and few failures for students who participate, and is one of the few programs to measure outcomes in terms of per cent of students passing a criterion-referenced test.

Middle grades schools provide students with remedial instruction -- in separate classrooms grouped by ability, in pull-out programs during regular classes, in extra class periods, by assigning extra teachers to work in the same classroom with regular classroom teachers, and in several other ways (e.g., Saturday classes, before and after school coaching or tutoring, summer school). Pull-out programs and extra math classes vary in the size of the group (the student to teacher ratio may range from 3:1 to over 20:1); the length of time of a period (from 15 to 60 minutes); the scheduling of extra help (e.g., removing students during class time or assigning them for remedial instruction during extra class periods), and the presence of extra teachers or aides in the regular math teacher's classroom.

The program evaluations do not clarify which of these factors and their designs are critical for program effectiveness, but the promising programs and new survey data offer a few clues. In the middle grades, scheduling may be as or more important than class size. Longer periods of 30 minutes or more rather than short 15-20 minute dosages of remedial instruction are probably needed in the middle grades. Extra class periods and the assignment of extra math teachers or aides to regular math teachers' classrooms probably benefits middle grades students because they are less stigmatizing than pull-outs from regular class.

Survey data from a national sample of principals in schools that contain grade 7 support the practice of an extra math period rather than pull-out approaches. Principals who reported that they provide remedial instruction in extra academic periods scheduled during the school day (as an elective or study period) were more likely to expect fewer students to drop out of school before high school graduation. No other remedial instruction practice was significantly linked to principals' expectations of lower dropouts (Mac Iver, et al., 1989).

Math and Student Recognition

All Chapter 1 programs describe how they reward and recognize students. This focuses educators' attention on the disadvantaged students' need to know that a teacher knows when they are making progress and that each new skill is important. Many NDN and other promising programs for middle grades students also are sensitive to the early adolescent's need for recognition, in ways that are valued by students in the middle grades. T.E.A.M., for example, combines active learning with responsive and public recognition to let each student and their peers and families know that progress in learning is made in clear and measurable steps. Other programs make a point of including Chapter 1 students in all recognition and reward assemblies or other school programs.

A basic issue in math and other subjects concerns whether to grade students on the basis of relative achievement, mastery, or progress. Promising programs suggest that math grades and recognition should be based on student progress rather than only on relative ability. Programs such as TAI and other processes (Mac Iver, 1990) take seriously the motivational power of progress reports, certificates, and public recognition.

Of all of the components of promising programs, regardless of instructional approach, it is likely that practices that organize and individualize frequent meaningful rewards and recognitions will positively influence students' motivation, self-esteem, achievements, attitudes and commitment toward math.

Math and Attitudes

Some promising programs make a point of developing students' positive attitudes about math. For example, **Comprehensive School Mathematics Program (CSMP)** is designed for the elementary grades, including grades 5 and 6. The program focuses on math applications, estimations, predictions, probability, statistics, and problem-solving -- the new high content topics. Effects on students' math skills are not particularly impressive, but the program showed some positive effects on criterion-based problem-solving test scores. The developers emphasize

the program's focus on increasing or maintaining students' enthusiasm about math. It reminds teachers that attitudes about math are as important as achievements in math for encouraging students to work hard and to continue taking math courses even if they are not the best math students.

Student Responsibility for Learning Math

Many promising programs in the middle grades require students to take responsibility for their own learning. Some programs (such as **Chapter 1 Mathematics Improvement Program** and TAI) put students in charge of part of a computer-based or paper management system to organize their own work and to keep track of their successes, failures, and needs for instruction. Other programs use "contracts," pledges, or other plans. For example, one technique called "**Challenge U**" asks students to design their own "contract" of math activities and math tests to assure that they complete the required units of work.

Math and Parent Involvement

The **Chapter 1 Reading and Mathematics Program** includes a strong parent involvement component with the specific goal of reaching the parents of more students. The project includes after-school computer classes for parents, and meetings with parents at public housing projects rather than only at the school building.

A few programs for disadvantaged students combine rewards at school with recognition at home. Teachers send home positive notes or certificates when students have mastered each important skill, or call families with positive messages. One middle school sends home weekly computerized "report cards" in math so that students and families can celebrate short-term progress. As noted above in T.E.A.M., the principal calls home weekly and parents are involved in regular evaluations of students' progress. In other programs, students are asked to show someone at home how they mastered each new math skill. These and other approaches mobilize family support for math in the middle grades. The practices are supported by research that emphasizes the importance of subject-specific parent involvement for boosting student achievement and attitudes in specific subjects (Epstein, in press; Epstein, & Dauber, in press).

Technology and Math Instruction

Promising math programs in the middle grades often integrate computer-based activities to organize, vary, enrich, and enliven instruction. Several promising programs in math (such as Classmate 88, The ESC Mathematics Curriculum, Math Motivational Centers (M^2C), and Traner Middle School Chapter 1 Lab) include clear and purposeful uses of computers by students to learn and to practice skills, and for teachers to manage instruction and monitor student progress. M^2C, for example, includes a management and instruction system for over 200 math objectives for an individualized program that helps the teacher select from multiple materials (workbooks, kits, audiovisuals, games, and computer-assisted instruction) to supplement skill learning. The program reported rather sizeable gains for students in grade 9 compared to a control group of students, and seems to be adaptable to the middle grades.

Other technologies, particularly the use of calculators, can supplement and enrich math programs. For example, **Calculator Assisted Mathematics for Everyday Living (CAMEL)** integrates the calculator and real life applications into the math program for general mathematics students. The program measures effects based on the percent of students mastering at least 70% of the material taught in each unit of work and almost all students attained that level of mastery. Although this is a program designed for high school students, the materials and approaches are adaptable to the middle grades. In general terms, middle grades math teachers will need to decide the place of "the calculator" in their math classes.

A promising new program that needs to be evaluated is **The Education Services Corporation (ESC) Mathematics Curriculum**. This computer-based program focuses on math problem-solving, inductive and deductive thinking skills, and the use of calculators and computers to provide regular lessons and individualized instruction. In grades

7 and 8, for example, software is available for over 150 lessons in algebra, geometry, graphing, statistics, and probability and other new high content math topics. A computer-based management system is included. ESC Mathematics Curriculum prides itself on lively, colorful lessons to build a solid math foundation in the middle grades so that students will continue with high school math. The integrated instructional system is an expensive one, however, requiring schools to rent software on an annual basis, after installing extensive hardware. It is said to be operating in over 1,000 schools, despite its high cost and lack of evaluations. It is a program to watch -- one that deserves to be rigorously evaluated because it combines several key components of promising programs with the added feature of enabling students to work at their own pace to accelerate learning.

Math, Thinking Skills, and New Roles for Teachers

One large investment in a supplementary math program is the **Middle Grades Mathematics Project (MGMP)** developed over more than a decade at Michigan State University with support from the National Science Foundation. Activities range from workshops for outstanding middle grades math teachers, to the development of a text-workbook series of math activities for middle grades students. The math activities are based on thinking skills in math, including spatial visualization, probability, similarity, factors and multiples, algebra, and other topics that are generally considered to add new and high content to math programs. Manipulatives are emphasized to give all students opportunities to visualize and construct math concepts. Disadvantaged students are not a special focus of this program, but creative teachers should be able to use and adapt the activities to teach the MGMP concepts to all students, including students at risk of failing math.

Staff development is central to MGMP. Teachers are defined first as "Mathematicians" and are helped to operate as such. This is an important and provocative component of many promising programs in all subjects. The goal is for teachers to feel that they are members and leaders of a community of active learners at school. They are not only "tellers" of information, but also thinkers, scholars, and workers. With their roles clarified, teachers are then provided clear guidelines on how to teach challenging middle grades math concepts to their students. The teachers are taught using the same methods they will use to teach the students -- another promising approach to staff development in several programs.

MGMP has been shown to strengthen teachers' self-confidence, skills, and understanding of math teaching. So far, less attention has been given to evaluating whether students learn more or better because of the program.

Algebra as New Content

NSF is supporting several projects to develop high content materials for middle grades mathematics. One provocative project that has reported information on its implementation is **The Algebra Project**. The Algebra Project seeks to make algebra available to all seventh and eighth grade students in disadvantaged schools, regardless of the students' prior skills or academic achievement in math. The project aims to motivate students in math so that they feel able and encouraged to take advanced and honors courses in high school.

The Algebra Project first accelerates sixth grade math skills to prepare students for algebra in grades 7 and 8. In grades 7 and 8 an advanced text is used along with motivating teaching approaches in algebraic concepts, such as positive and negative numbers. The program also includes family and community connections, places responsibility on students for the pace and scope of their learning, and includes before-school study sessions with college role models as tutors for the middle grades students. The Algebra Project operationalizes many components of "accelerated" education with new content and new access in the middle grades math curriculum. Although the evaluations so far do not adequately examine student skills and abilities, there is evidence that some students in the program enter honors math in high school where none did before.

Math: Summary and Discussion

Math may be the easiest subject to evaluate because of its hierarchy of skills and numerical character, but most schools and districts do not assess their math programs carefully. Few reports from promising math programs provide the comparisons that are needed to show that one program is clearly and consistently better than another for disadvantaged students in the middle grades. Presently, there is no one program that stands out as unusually and consistently effective. Rather, the programs discussed in this section are promising. Some fully restructure math education and others revise practices slightly. The key components in these programs may be important for improving math instruction for disadvantaged students. These include:

Comprehensive management systems
- Conceptually Oriented Mathematics Program (COMP)
- Individualized Prescriptive Arithmetic Skills System (IPASS)
- Math Motivational Centers (M^2C)
- Operation Uplift
- Systematic Teaching and Measuring (STAMM)
- Traner Middle School Chapter 1 Lab

Effective grouping practices and individualized instruction
- Chapter 1 Mathematics
- Team Accelerated Instruction (TAI)
- Traner Middle School Chapter 1 Lab

Extra class periods
- Classmate 88
- Operation Uplift
- Teaching Everyone About Math (T.E.A.M.)
- Traner Middle School Chapter 1 Lab

Effective rewards and recognition of students
- Comprehensive School Mathematics Program (CSMP)
- Teaching Everyone About Math (T.E.A.M.)
- Team Accelerated Instruction (TAI)

Student responsibility for learning
- Challenge U in Teaching Everyone About Math (T.E.A.M.)
- Chapter 1 Mathematics Improvement Project
- Team Accelerated Instruction (TAI)

School and family connections
- Chapter 1 Reading and Mathematics
- Teaching Everyone About Math (T.E.A.M.)

Computer-assisted instruction
- Classmate 88
- ESC Mathematics Curriculum
- Math Motivational Centers (M^2C)
- Traner Middle School Chapter 1 Lab

Innovative curricula
- Middle Grades Mathematics Program (MGMP)
- The Algebra Project

Staff development
- Conceptually Oriented Mathematics Program (COMP)
- Middle Grades Mathematics Program (MGMP)
- Systematic Teaching and Measuring (STAMM)

One of the standard debates about math for disadvantaged students is whether such programs should provide instruction in computational skills or higher level math skills. The promising programs reviewed do not resolve this debate. Indeed, this may be a false distinction, as basic skills provide a base of high initial content on which students build more complex skills as they are ready and able. Instruction in basic skills need not be boring. After all, when the same skills were taught to all students the first time, high-ability students were challenged and interested in the lessons. This dilemma may be solved if teachers have varied materials and several different instructional methods to present skills to students who do not learn them the first time. It is pretty clear from programs on the horizon that math programs of high content will, in the future, help all students understand and apply skills in problem-solving, estimation, statistics and probability, measurement, and other topics recommended by the National Council of Teachers of Mathematics.

Reading: Promising Programs for the Middle Grades

Promising programs in the middle grades include those that emphasize developmental reading, literature, reading across the curriculum, the integration of reading, writing, thinking, and related skills; school-based reading for pleasure, and at-home reading activities or other connections with families. One key component of most programs is that they draw on a wide selection of reading materials at many reading levels to capture the interests of students of all abilities and to encourage students to work to advance their skills in reading and in all subjects where reading is important.

Reading Management Systems

A management system in reading may help teachers diagnose, instruct, and monitor 30 to 50 or more objectives at 16 different skill levels, providing teachers with over 24,000 pieces of information about students and their progress. These programs also organize a wide variety of appropriate materials and technologies for teachers to provide students with instruction in different ways on all skills. It is possible -- though not yet proven -- that a management system that helps teachers carefully orchestrate individualized instruction will help students accelerate learning.

Management systems are only as good as the materials that support the instruction that students need. Teachers and curriculum supervisors often collect numerous and varied materials, and cross-reference them so that teachers can find and use appropriate and varied approaches for each skill they teach in a clear "scope and sequence" of skills at each grade level. For example, the **Individualized-Diagnostic-Prescriptive Learning Lab** Chapter 1 program which includes grade 6 in an elementary school, reports that it uses twenty times as many instructional resources as regular classrooms. Evaluations of this Learning Lab show mixed results in different schools, varying from no gains, to modest gains, to sizable gains over one or more years. (Evaluations of a variation of this program in math report sizable gains for students in math skills, perhaps due to rich instructional resources in math.)

Individualized Prescriptive Instructional Management System (IPIMS) is a remedial Reading Center based on individualized instruction and clear record keeping. Staff training is provided as part of the adoption procedures of this NDN program. Students use color-coded, multilevel materials to follow an individual plan designed to be highly motivating. Parent involvement is part of the program design. Modest gains are reported for participants.

PEGASUS-PACE is a continuous-progress program that starts with a full array of skills and techniques for teachers to diagnose students' starting levels of learning, provide appropriate instruction, and monitor student progress. PEGASUS-PACE provides the computer software needed to produce the charts to monitor student progress and also includes other reading activities software for teachers and students. In this program, teachers, student-teachers, classroom aides, secretarial assistants, and video technicians work together as a team. Leadership for the team is provided by a Project Director, evaluator, and curriculum experts. PEGASUS-PACE uses several components of promising programs -- extra staff, high-level supervision, new technologies, and a management system to organize teaching and monitor learning. In one school results are measured in terms of the per cent of students who attain "mastery," and about 80% of the participants in two middle grades (grades 5 and 9) reach the required level.

Some programs try to solve the problem of burdensome record keeping by assigning students the responsibility to keep their own records of work and progress. Others replace paper management systems with computer programs to ease teachers' record keeping activities. Although other types of reading programs may prevent problems from occurring, effective and efficient management systems that monitor needs and progress may be necessary to treat problems, much the way that medical models identify, prescribe, and monitor the effects of alternative medicines or dosages.

Reading Pull-Out or Pull-In Approaches

Treatment programs either pull students out of regular classes for extra reading instruction, pull teachers in to regular classrooms to provide extra teaching during class time, or pull students in to extra reading periods in addition to regular classes. Several pull-out or pull-in approaches bring extra staff to the reading program. All types of assistance require a high degree of coordination between regular and remedial reading teachers.

The Washington Middle School Reading Intervention Program arranges a "limited pull-out" program for students in grades 6 and 7 in which students receive remedial instruction for 40 minutes a day for two of every three weeks. All students attend the multi-media reading lab during the third week of the cycle where they work at 18 learning stations to improve specific reading skills. Eighth grade students who are behind in skills receive services every day in an extended pull-out program. The more intense focus for eighth graders is a "last chance" transitional program to help students learn skills they will need in high school.

A management system underlies the Washington Middle School Reading Intervention Program for all three middle grades to help teachers diagnose students' needs, prescribe and provide lessons in needed skills, and test and monitor progress. The activities use multiple media including computers, film, tape, study skills, regular lessons, tests for mastery, and other techniques. Still, the program does not report impressive or consistent gains. It may be that the sixth and seventh graders need more intense interventions, or that the program is not coordinated closely enough with reading skills that are on standardized tests. This program, like many others, illustrates that programs need to continually assess and revise practices until they can demonstrate clear and consistent effects on students' skills.

Many pull-out programs make purposeful decisions about which classes students will miss for remedial work. For example, **Chapter 1 Reading** purposely does not remove students from regular reading, math, library, art, music, or physical education classes, as these are considered necessary basic skills classes or rewarding experiences. **The Chapter 1 Remedial Reading: We Can Help Them Read** program instructs sixth graders during a study period, not a regular subject class period in which the students would be visible by their absence. In promising middle grades programs, teachers tend to provide remedial instruction in extra class periods to maximize students' exposure to and participation in regular class work and to minimize students' feelings of embarrassment about needing extra help.

Teaching Reading And Interesting New Stories (TRAINS) is a program for middle grades students to improve functional reading, independent reading, and self-esteem or self-concept of ability as a reader. A formal link between the school and a local college provides big brothers and big sisters to Chapter 1 students in the middle grades. The students meet for skill building activities for 42 minutes daily (presumably one period), but only during social studies or academic assistance (study) periods, not during other regular classes. The program uses multi-media materials, including computers for instruction. The middle grades students write their own books for students in the primary grades and read them to the young children. With student teachers and aides, the teacher-student ratio in the remedial classes is 1 to 6. However, only modest gains on test scores are reported for the students in the program.

In the **Waukegan Reading Project** students are assisted for 30 minutes a day with many high interest/low readability materials, with an added focus on study skills. The study skills process -- SQ3R -- stands for Survey, Question, Read, Recite, Review. An interesting feature of this program is the assessment of students' read-aloud progress. Teachers tape record students' oral reading at the start and end of the year and share these tapes with each student's parent at a parent-teacher conference. The program shows modest gains in reading skills.

Many promising remedial reading programs add staff to provide students with more immediate and better attention and to provide teachers with the best information and guidance about good practice. Several Chapter 1 reading programs add teachers, aides, paraprofessionals,

supervisors and/or program directors to increase services to students and to improve conditions for teachers. For example, **Chapter 1 Reading and Math Program**, which aims to accelerate students' learning beyond one year's progress in one year's time, includes a Program Director, four resource teachers, a paraprofessional aide, a parent resource teacher, and computer-assisted instruction to provide students with extra help. This program also aims to increase the involvement of all parents, which may be another way to increase the number of adults who encourage and support student learning.

ESL Supplemental Program for Limited English Proficient Students is a bilingual program that coordinates student reading and communication skills with home, school, and community connections. The program for grades K-6 includes three teachers and three aides who provide individualized instruction on the skills students need in regular classrooms. Students meet 45 minutes a day, five days a week, to work on listening, speaking, reading, and writing skills, especially as these relate and apply to the students' home and community. On reading tests, the program has mixed results -- students in some grades make small, modest, or large gains, and others lose NCE units over a year. More information is needed on whether and how the extra staff and the emphasis on home and community linkages benefit students. Although this program was designed for the elementary grades, its components are adaptable to middle grades schools and to non-ESL remedial programs.

After-school and summer programs also provide extra learning time for students, just as pull-out or extra class periods do during the school year (Davidson, & Koppenhaver, 1988). Remedial and enrichment classes after school and in the summer may help the students who can join those classes, but cannot take the place of ongoing programs for all students that are part of the regular school day all year.

Wilkes County Chapter 1 Project is a typical, promising, Chapter 1 reading program that includes many potentially important components -- individualized instruction, recognitions and rewards for students, parent involvement, reading for pleasure at school and at home, 30-50 minutes daily extra assistance, and extensive staff development so that the teachers can implement the program effectively. The program reports sizable gains but low scores and inconsistent results for students at different grade levels and across several years in time.

In reading, as in math, programs vary in the number of students in remedial instruction classes (from one-to-one tutoring up to full classes of over twenty students), the number of teachers and aides, and the length of class periods (from 15 to over 60 minutes). There are no studies, however, that adequately test the effects on student progress of differences in class size, time, staffing, or other components to know which features or combinations are more or most effective.

Developmental Reading in the Middle Grades

Many districts outline a full developmental reading program for K-8 or K-12 based on one or more textbook series and/or selections of literature for each grade level. Students are expected to learn a vast and varied array of vocabulary, comprehension, writing, and other skills that create a developmentally coherent program. Most developmental reading programs use reading textbook series, but developmental reading also can be conducted when students read literature. A few promising programs are described here.

Structured Teaching in the Area of Reading (STAR) is designed to improve the reading skills of students in grades 2-9 by linking reading and writing. In grades 7-9, this program takes the form of a 10-period Communications Arts Program, not a daily period as in the earlier grades. Results from the program in the upper grades are inconsistent, with strong gains reported only in grade 9. The program was designed to respond to students' needs to continue to develop reading and writing skills through the middle grades, but ten periods of work may not be enough to do the job.

Andover's Integrated Reading System (AIRS) features lessons to increase reading comprehension and enjoyment of literature. It includes a computer-based

management system that helps teachers organize and monitor students' progress. The program focuses on 18 skills to improve reading comprehension for students who are at first through seventh grade reading levels. Modest gains were reported for the students in the program. Although designed for the elementary grades, the program and approach are adaptable to the middle grades. The AIRS lessons may be used or adapted to supplement any textbook series.

A different approach is taken in a new, not-yet-evaluated program developed by the Harcourt Brace Jovanovich Publishing Company, **Discoveries in Reading**. Soft-covered books and workbooks in this textbook series have been designed to interest middle grades students who have low reading skills. The publisher includes stories that appeal to early adolescents and tailors some stories to particular cities or states. For example, the sample books were written for use with disadvantaged students in Boston and include stories that refer to Boston's sports teams, police, and other activities. If the program proves to be effective, it will be an attractive option for teaching basic reading skills because of its relatively low cost. It is, however, a textbook series that does not require students to read literature.

Reading Literature

Several promising programs emphasize reading literature -- good books at the students' own reading levels that advance their abilities and interests and lead to ever more challenging books. Literature adds high content to reading programs, whereas some textbooks include mundane reading selections or parts of digested literature to help students practice reading skills. Promising programs based on literature assume that developmental reading skills can be taught from novels and other literature at the same time that students are introduced to provocative ideas, novel characters and settings, and a love of words. In many cases, however, teachers must take the initiative to design well-structured lessons for reading skills in literature, whereas the teachers' manuals provide reading lessons for the textbook series. It is becoming increasingly clear that all students, including students at risk of failing in reading, can use, enjoy, and benefit from reading literature to build vocabulary, comprehension, and thinking skills. Data are not available on the skills learned or missed in literature vs. textbook reading programs.

Cranston's Comprehensive Reading Program (CCRP) is an example of a district-wide K-12 management system for a developmental reading program that includes children's literature as one of several components. The developers suggest that it can be used along with any textbook series to help teachers organize instruction and to monitor students' progress in reading. The program description relates that students in the program made important fall-to-fall gains -- a rarely used criterion -- but the actual data from the evaluation are not reported.

One promising program -- **FUTUREPRINT** -- emphasizes reading and great literature for all seventh and eighth graders. An adaptation of a "great books" approach, it gives students responsibility for their own learning and provides incentives for middle grades students to complete work as quickly and as well as they can. The program also assigns middle grades students to read aloud to preschool children. Teachers identify students' starting reading levels, design personal contracts with students to include specific reading, writing, and other skill development, instruct small groups or individuals on specific skills, and give students clear evaluations of their work.

The program provides lists of reading books and selections in Science Fiction, Adventure, Sports, Teenage Interests, Mystery, Animals, Classics, and other topics. There are over 125 selections for students who read at grades 1-4 reading levels (i.e., high interest, low readability materials); over 125 selections for students at grades 4-6 reading levels; about 120 selections for students at grades 6-8 reading levels; and about 90 choices for students reading at grade 8 level or higher. The program emphasizes student participation in their own learning and in service to others in reading to young children. Modest NCE gains were reported for students in the program. The lists of book selections for different reading levels are an important resource that may be useful to many teachers and curriculum supervisors seeking high

content books that interest middle grades students who are reading below grade level.

Reading and Writing

A promising combination for the middle grades is the integration of reading and writing activities. Presently this is a "hot topic" in the elementary grades starting with the controversial, computer-based "Writing to Read" program in kindergarten and grade 1 to more conventional integrated programs through grade 5 or 6. Some middle grades schools are just beginning to acknowledge that they must provide students with reading courses separate from and in addition to English courses. A few have also recognized the natural and important connections between reading and writing, or reading, writing, thinking, and other subjects. Much more needs to be done to adequately evaluate programs that integrate reading and writing or integrate other subjects into reading programs based on basal texts or literature.

One promising approach is **Cooperative Integrated Reading and Composition (CIRC)** for grades 1-8. This program links reading and writing and includes students as active learners with responsibility for their learning and progress. CIRC -- a cooperative learning approach -- assigns students to heterogeneous teams to read aloud to each other, to help each other with questions about reading and writing, and to react to each other's written work. CIRC follows a standard "writing process" approach to help students improve their writing skills, but asks students to write about what they read. CIRC emphasizes clear and frequent rewards and recognitions of students' individual and team progress.

A variation of CIRC -- Student Team Reading -- is being developed in middle schools for disadvantaged learners. It emphasizes high interest reading selections in a literature rich anthology for students who are not on grade level and adds instruction in study skills to help middle grades students learn how to learn. These approaches are promising, but have not yet been evaluated in the middle grades.

Reading Across the Curriculum

Reading Education Accountability Design: Secondary (READ:S) is an NDN program for reading in grades 7-12. Some sample activities of READ:S look interesting, others ordinary, and others dull. In one implementation of this program, a "building expert or leader" coordinates the program and guides the teachers who are using READ:S. Staff leadership and expertise may be important for implementing successful programs. Building experts or lead teachers are paid for their extra work coaching teachers, much as coaches or club leaders who assist students.

READ:S outlines 60 skills in reading (including vocabulary development, reading comprehension, and study skills) that can be reinforced across all subjects in the curriculum. The program includes computer-assisted activities that can be used by teachers of different subjects to teach reading skills in their content areas. The coordination of reading skills across subjects is based on priority skills in the language arts curriculum.

READ:S boasts high participation from teachers of many content areas. This has been a problem for many programs that report that subject specialists do not want to teach reading even when their students need reading skills to succeed in their subjects. The components of READ:S may provide some important ideas for solving that problem. Evaluations of READ:S suggest students improve general reading skills, but less attention has been paid to evaluating student learning in different content areas.

Content Reading Including Study Systems (CRISS), designed for the high school level, illustrates the same idea of reading across the curriculum. In this program, staff development is provided for teachers of science, math, social studies, and English classes so that they feel comfortable teaching and reinforcing reading and study skills. Students also are helped to build skills in note taking, self-questioning, organizing reading content, and other learning strategies. Evaluations suggest the program helps high school students retain and

recall information. The program developers suggest the program can be used from grade 4 up, but evaluations of program effects need to be conducted in the middle grades.

Project R-3, named for Readiness, Relevancy, and Reinforcement, is a comprehensive program that aims to integrate reading, math, and social studies to help students accelerate their learning and make up lost skills. Project R-3 is promising because it stresses active learning, makes learning relevant in terms of real world problems and issues, and purposely involves parents in the students' activities. The program includes 18 booklets with over 140 active learning, career-related, math and social studies activities. The program reports that students in Project R-3 make 1.5 months reading gain for one month of program participation, and even greater gains in math -- 2.7 months gain for one month of program participation. The program could enliven reading, math, or social studies classes in some interesting ways.

Even if these or other programs are not adopted in full, the procedures and materials that have already been produced by program developers for reading across content areas should be helpful in other schools.

Reading and Connections with Families and Communities

Books and Beyond, an NDN program for grades PreK-9 encourages students to read more, watch TV less, and involves parents in children's reading for pleasure at home. Books and Beyond and similar programs (such as Book-It or other variations on this theme) suggest that teachers, students, and families can become more aware of students' TV and reading habits and that students and families can be motivated to increase reading for fun. Many promising reading programs include some attention to reading for pleasure at home and involving families in sharing or recognizing students' reading skills and interests. Innovative teachers could adapt programs like Books and Beyond to make even stronger connections between their school reading program, reading for pleasure, and family involvement.

The Friendly Place connects schools with the local community to support student achievement in reading. Located in a storefront on the first floor of a housing project, The Friendly Place is an informal library/bookstore that operates as an after-school center of activities providing homework help, crafts, other club activities, and Saturday activities as well. It is a community literacy center for children and adults which provides books and other materials for all reading abilities, and other enrichment and care.

Helping One Student to Succeed (HOSTS) engages volunteers as mentors and tutors in reading for students in the middle grades. Parents or other volunteers from the community meet with one or a small number of students for one half hour every day to practice specifically prescribed reading skills and to bolster students' self-esteem and attitudes toward reading. A computer-based management system helps teachers diagnose students' skills that need attention and cross-references materials that tutors use to teach students specific skills. The program evaluations suggest that middle grades students in the HOSTS program make important gains in reading scores over one year, although the evaluations lack clear comparison groups.

Reading and Reducing Classroom Interruptions

Elementary Language Arts Team Effort (ELATE) purposely reduces or eliminates interruptions to classroom learning time. For example, assemblies are scheduled so that they do not interfere with time set aside for reading. Announcements on loudspeakers are made at predetermined times and not throughout the day. This is a basic practice to support high content that is important in the middle grades or at any level and in all subjects.

Reading and Staff Development

Reading, Thinking, and Concept Development is an upcoming program supported by the College Board and Public Broadcasting System (PBS) that will provide training for teachers in ways to improve students' reading comprehension. The training program

consists of seven 30-minute PBS-TV shows on effective teaching strategies for the middle grades. The content of the proposed programs includes innovative approaches to teaching such skills as anticipation, prediction, questioning, responding, and other thinking skills that most reading programs presently ignore. Although this is not a "reading program" in the traditional sense, the staff development for teachers may be generally useful. Teachers may be able to apply the techniques to increase reading and thinking skills in any subject.

A Sample Reading Program with Many Components

One interesting approach to improving practice is the "California Demonstration Programs" in Reading and Math for middle and junior high schools. The state funds 24 programs annually that show promise for accelerating the learning of students who fall below grade level. The goal is to create and implement programs that help students make two to three times the progress that is typically expected in one year. All of the demonstration programs must provide cost/benefit analyses of their results, and state funds are withdrawn each year from the least effective programs. Thus, there is an ongoing and continually improving set of evaluated programs available for our educators to consider. The demonstration programs are not "miracle cures," however, and face the same problems of proving their effectiveness as other programs.

One program funded as a demonstration was **Project Leaderprint**. In the demonstration school, 40% of the incoming seventh graders tested below fourth grade in reading. Many students were transient, truant, and had low self-esteem. The school's goal was to initiate a reading program that would help each student make 1.3 months of growth in reading for each month in the program. The reported results are higher than that -- about 2.0 months of growth in reading for each month in the program.

Project Leaderprint included a contract system that put students in charge of their own progress. Students were asked to choose activities to earn 10 contract points a day. Other components included a low teacher-student ratio, high interest materials, an uninterrupted sustained silent reading program, individualized oral book reports, and other practices. A program director and four aides assisted classroom teachers in working with students who were behind grade level. The program included a large inventory of materials including books ranging from 2nd to 10th grade reading levels, films, tapes, read-alongs, workbooks, kits, and others. Reading materials covered topics in literature, career awareness, sports, history, music, art, science, and social studies.

Project Leaderprint used innovative scheduling and included all students, not only disadvantaged students. The students rotated every 4-6 weeks from English to reading classes and back again, for a total of one half year of reading and one half year of English instruction during one year. The program included an unusual and potentially important alternative evaluation system in reading that was not associated with the students' English marks or report card grades. Students who did poorly in English were not automatically penalized with poor grades in reading if they made real progress from their own starting points in reading skills. A variety of rewards and other recognitions also were offered, including free paper back books, positive notices to home, and trophies for students who made the most improvement.

The design of Project Leaderprint included many of the components of promising programs and illustrated how these components can be combined without stigmatizing disadvantaged students in the middle grades. Ironically, despite its ambition, extensiveness, and promise, Project Leaderprint is no longer operating. It is an example of the continuous appearance and disappearance of promising programs in schools across the country. The programs disappear as financial support, leadership, and teachers change. Educators who see some promise in the components of Project Leaderprint will have to reinvent them in their own schools. Materials will have to be redeveloped. This problem could be partially solved if there were an active clearinghouse in which materials -- such as high interest/low reading skills materials -- were classified, stored, and shared so that educators could use the products of previously developed programs, even if the programs were no longer available.

Reading: Summary and Discussion

Promising reading programs aim to improve students' basic reading skills. Each program reviewed includes one or more special emphases that give the program a unique quality or personality. These include emphases on improving self-esteem, attitudes toward reading, reading for enjoyment, or family involvement. Some programs set in motion a "token economy" that rewards students for good work. A few alter the grading system to reward progress and not just performance relative to others. Most recognize the need for many and varied materials, including computers, audio-visual materials, multilevel books, or other resources. Others emphasize students' responsibilities for their own work.

To reach various cognitive and affective goals, programs typically combine highly prescriptive lessons in reading skills with more open, student-directed activities -- such as students choosing books to read for enjoyment in school or at home. It is not yet clear what combination of high prescription by teachers and high choice or self-direction by students leads to the most learning and the best attitudes in reading in the middle grades.

Reading programs have not been evaluated rigorously enough to show that one program is clearly and consistently better than another for disadvantaged students in the middle grades or which of the many different components contribute to students' success. Nevertheless, the promising programs reviewed in this section include components that educators should consider for improving reading instruction for disadvantaged students. These include:

Comprehensive management systems
- Individualized-Diagnostic-Prescriptive Learning Lab
- Individualized Prescriptive Instructional Management System (IPIMS)
- PEGASUS:PACE
- Washington Middle School Reading Intervention Program

Pull-out or pull-in approaches
- Chapter 1 Reading
- Chapter 1 Reading and Math Program
- Chapter 1 Remedial Reading: We Can Help Them Read
- ESL Supplemental Program for Limited English Proficient Students
- Teaching Reading and Interesting New Stories (TRAINS)
- Waukegan Reading Project
- Wilkes County Chapter 1 Project

Developmental reading
- Andover's Integrated Reading System (AIRS)
- Structured Teaching in the Area of Reading (STAR)

Effective grouping practices
- Cooperative Integrated Reading and Composition (CIRC)

Effective rewards and recognition of students
- Project Leaderprint

Student responsibility for learning
- Chapter 1 Reading
- FUTUREPRINT
- Project Leaderprint

School, family, and community connections
- Books and Beyond
- Chapter 1 Reading and Mathematics
- Helping One Student to Succeed (HOSTS)
- The Friendly Place

Computer-assisted instruction
- Reading Education Accountability Design: Secondary (READ:S)
- Teaching Reading and Interesting New Stories (TRAINS)

Reading across the curriculum
- Content Reading Including Study Systems (CRISS)
- Cooperative Integrated Reading and Composition (CIRC)
- Project R-3
- Reading Education Accountability Design: Secondary (READ:S)

Innovative curricula
- Cranston's Comprehensive Reading Program (CCRP)
- FUTUREPRINT

Extra staff
- PEGASUS:PACE
- Project Leaderprint
- Reading Education Accountability Design: Secondary (READ:S)
- Reading, Thinking, and Concept Development

Staff development
- Wilkes County Chapter 1 Project

Writing and Language Arts: Promising Programs for the Middle Grades

In writing, promising programs focus either on helping students become better writers using the writing process or helping teachers become better evaluators of students' writing. Of all of the programs reviewed in any subject, the most consistently praised programs with consistently positive findings are those based on the "writing process." This refers to the original Bay Area Writing Process now called the National Writing Project (Daniels, & Zemelman, 1985).

In language arts, programs address problems similar to those discussed in reading and math -- how to design effective prevention and treatment programs to improve the content of language arts curricula, how to provide effective remedial instruction, how to provide alternatives for staffing more effective programs for disadvantaged students, and how to monitor and evaluate student progress. New directions to create high content language arts programs include linking writing to language arts and basing all language arts work on the elaboration of the successful writing process; or linking language arts and reading, writing, and thinking; or creating other interdisciplinary connections (e.g., language arts and art, music, science, social studies, or other subjects).

The Writing Process

Project Write aims to improve the skills of students who need remedial instruction in writing. The program recognizes that students feel rewarded when their writing is "published," and that students at risk of failing rarely have their work praised by their peers, teachers, or families, or published for others to read. In Project Write, at-risk students engage in the writing process to plan, write, rewrite, have peers read, review, and react to their writing, and bring their work into final, publishable form. The program operationalizes theoretical aspects of accelerated education in writing. Evaluations of this program report the mainly positive perceptions of teachers, administrators, and parents of the program, with little information on quantitative effects on students' skills or the students' attitudes.

Writing Is Thorough and Efficient (WR.I.T.&E.) applies the National Writing Project process to improve students' fluency in composing written work. WR.I.T.&E. replaces the language arts curriculum with an integrated approach to language through writing. Students are helped to organize, classify, compare, contrast, and express ideas through writing journals, working as "young authors," and learning literacy skills that include the mechanics of writing, grammar, spelling, and other language skills. Although there are no comparison or control classes in the evaluations reported, WR.I.T.&E. reports very consistent and significant pre- and post-test score gains for students in the program in many schools and across grade levels. This program is a strong testimony to the success of the writing process and of the potential benefits of integrating writing and language skills.

Thinking and Writing

Thinking to Write is mainly a writing skills development program based on the writing process. The manual for teachers emphasizes the need to develop students' abilities to analyze,

synthesize, make comparisons, consider strategies, and apply other thinking skills. The workbooks for students offer a series of "prompts" to help students organize their thoughts and to progress in their writing from relatively simple classifications and observations to more advanced expositions and syntheses of ideas. Although no evaluation data are provided on this program, the approach and exercises for students may be useful to middle grades teachers and can be adapted for use in any writing program.

Evaluations of Students' Writing

The Profile Approach to Writing is designed to help teachers reduce the time it takes to evaluate large numbers of writing assignments, and, by doing so, increase the amount of writing teachers ask students to do. Teachers guide students in rewriting and improving their work with standardized instructions to examine the content, organization, vocabulary, language use, and mechanics of writing in their first drafts. But mainly, The Profile Approach to Writing focuses teachers' attention on how to look at students' writing and evaluate it quickly and reliably. The program provides some evidence that it improves teachers' speed and reliability and that students from diverse backgrounds subsequently pass writing tests, but there are no strong comparative data that provide convincing evidence of the effectiveness of this approach for all students or for disadvantaged students.

The **Ferguson-Florissant Writing Project** provides teachers with training in the use of the writing process including prewriting, composing, editing, and evaluating written work, and training in the use of holistic scoring procedures to grade students' work. This is a combination program that applies the National Writing Project process to improve students' writing and a strong emphasis on helping teachers understand how to evaluate writing. The formal evaluation of this program demonstrates the success of the writing process as students trained in the Ferguson-Florissant Writing Project improve their writing skills more than other students (Hawkins, & Marshall, 1981).

Writing or language arts programs to improve teachers' evaluation techniques often require the evaluation of students' work over time. Teachers compare writing samples from students at the beginning and end of the year to see how students' skills improve. This useful technique can be used in conjunction with any writing program.

Writing and Technology

The Education Services Corporation (ESC) Writing Program is one of several computer-based integrated instructional systems available that help students use word processing skills in the writing process. Students are guided on screen through prewriting, first drafts, revising and editing, and final drafts. Students write narratives, descriptions, letters, news stories, and other forms as part of the program.

Like other ESC computer instruction, the Writing Program requires extensive hardware and software. Because of the cost, excellent cost/benefit evaluations of effects on student learning are needed. These need to compare the integrated instructional packages in writing (and in math, reading, and science) offered by ESC, WICAT, CCC, and other companies. Comparisons also must be made of students' successes and problems in computer-based vs. regular classroom instruction.

In writing, for example, word processing is the way that students will write in the future. If computer-based instruction makes learning to write, edit, rewrite, and review peer writing easier and more interesting, students using computers should have better attitudes about writing and could do measurably better writing than students learning to write in other ways.

Staff Development for Writing

Most promising writing programs follow the National Writing Project process in which students plan or "pre-write," compose, obtain peer or other reactions, and edit, rewrite, and evaluate their work. Different programs adapt this process, adding components to enrich the

process or to help special groups of students. The writing process and its many adaptations require extensive and excellent staff development and support for teachers because the process -- as close to "effective" as any in this review -- requires more time and effort by students and by teachers than typical writing exercises (e.g., as when teachers assign a topic, give students 30 minutes to write a composition, grade, and return papers).

The promising programs suggest that approaches to improve teachers' mechanics of evaluating writing should be used along with other practices to improve the students' writing process -- e.g., how students are taught to think, write, rewrite, and react to their work. For example, the detailed checklist in The Profile Approach to Writing gives teachers good guidance about grading, but needs to be combined with a highly active, motivating writing process for students to improve their writing skills. Curriculum teams in schools and districts will need to know about several programs in order to combine components for effective programs overall.

Teachers have choices to make among several promising programs that set similar goals. For example, teachers may compare **Individualized Language Arts** with WR.I.T.&E. The Individualized Language Arts program features a diagnostic and prescriptive approach to improving students' writing and language skills. It provides teachers with 2 days (10-15 hours) of in-service training to implement this program. WR.I.T.&E. sets students in motion as writers and asks teachers to work as writers too. Teachers require 3 days (15 hours) of in-service to implement the techniques. The Profile Approach to Writing provides teachers with 4-5 days of in-service training to enable them to read and grade students' writing more quickly and objectively.

Several staff development approaches develop the teacher as a writer in a community of active learners. That is, the teacher learns the writing process and how to teach it by writing his/her own work and continues to write with students in class. The students see the teacher as a writer and writing as something that the teacher considers personally important.

Clearly, if teachers are to learn about, adapt, and implement these and other writing programs, they will need time for staff development and time to work together. States, districts, and schools must give serious attention to the design and delivery of staff development for middle grades teachers (Epstein, et al., 1989a), particularly for teachers and administrators who are responsible for improving programs for disadvantaged students.

Language Arts Remedial Instruction

Elementary Language Arts Team Effort (ELATE) in language arts and reading combines prevention and treatment approaches. Regular and remedial teachers are given extra planning time to work together to coordinate their work with students. Chapter 1 teachers work in the regular teachers' classrooms to provide immediate instruction or tutoring to small groups or individuals. When students are pulled out for extra help, the activities are based on regular class work because the remedial instruction teachers are familiar with the students and their lessons.

Chapter 1 programs that apply for national recognition are asked to document how they operationalize several tenets of effective schools. For example, ELATE describes its goals and objectives, parent and community involvement, strong leadership, appropriate instructional materials, high expectations for students, regular feedback, monitoring, and reinforcement of students, and other practices considered effective. This project also arranges for high coordination of regular and special service teachers, professional development, and maximum use of classroom time for learning. It is one of many examples of thoughtful descriptions of Chapter 1 programs. ELATE reports gains for students that exceed the gains of Chapter 1 students in the state at some grade levels but not others. Programs like ELATE that include many promising components need to be carefully evaluated to learn which components are more or less important for the success of the students.

The **Reading English Rotation Project** is a treatment program to correct learning problems. Students who need extra help

are grouped and regrouped to work with teachers on the skills they need. In a 90-minute block of time, the students rotate through three classrooms called Skills Lab, Developmental Reading, and Basic English every thirty minutes for specific reading and language skills. The aim of this program is to keep students who have short attention spans moving and motivated and to allow teachers to specialize in teaching specific skills. It raises one of many controversies about middle grades education and remedial instruction. Do middle grades students have short attention spans? If they do, should they have short classes? Can middle grades classes be effective if they are only 30 minutes long? Is this the best organization of a large block of time for reading and language arts in the middle grades? Should teachers specialize or generalize their skills?

The Reading English Rotation Project evaluates its success by the percent of students who start out behind grade level and who make more than ten months progress in a ten-month school year. However, in the evaluation report, only about half the students attain that criterion. This program may be viewed as an alternative approach for some students who need help but who do not respond well to a regular language arts program. To know this for sure, however, better comparative evaluations are needed.

Language Arts and Extra Staff

Individualized Language Arts provides staff training and follow-up activities for teachers who adopt the program, as do most NDN programs. Even more important, the school or district must put someone in charge at the school site to help teachers use and evaluate the new method. This extra leadership may be critical to the successful implementation of new or improved programs.

The Individualized Language Arts program helps teachers diagnose students' strengths and weaknesses in language skills and provide instruction based on students' needs. It includes a holistic scoring procedure to help teachers evaluate students' writing. Although several evaluations have been conducted, only summaries of results were provided. These suggest that students' writing improved from the beginning to the end of the school year, at least in some grade levels, and compared to similar groups. There is no way to know how much the extra staff and leadership contribute to the success of the program in improving students' writing over other writing programs.

Nevertheless, extra staff is an important component in several programs in reading, language arts, and other subjects that we have discussed. For example, the Reading English Rotation Project requires a lead teacher who is in charge of four aides in a reading lab that includes appropriate computer hardware and software and other diverse, non-textbook materials. Districts that want to help students accelerate learning are going to have to find ways to invest in or reassign extra personnel and materials to implement promising programs with intensity and integrity.

Language Arts Enrichment

Supplementary programs are available to expand and enrich students' basic language skills. Culminating activities (such as theater productions) are important motivators and provide students with evidence of their progress and completion of work. Middle grades students, including educationally disadvantaged students, respond well to drama, creative dramatics, dramatic readings, and other group-oriented theatrical activities that encourage student participation in the use of language.

One example of this is the **Folger Library Shakespearean Festival** for grades 4-12. This program (or adaptations of it) can be used with heterogeneous groups of students. Productions need not be elaborate, and often need no props or costumes. Middle grades English, language arts, reading, social studies, and other teachers should be aware of the potential of drama for providing opportunities to improve students' skills in communication, higher level thinking, and social interaction.

One reason that drama is often overlooked as a promising practice, is that teachers lack the training that gives them confidence to manage drama with educationally disadvantaged students. Many teachers fear that such activities are inefficient in terms of time use, or that the students will get "out of control," or

that drama is unrelated to important skills. As in most examples of promising practices, staff development is the key to how well middle grades teachers of educationally disadvantaged students implement practices to involve students in dramatics to boost students' interest in and production of language.

Language Arts and Family and Community Connections

Several promising programs involve families in their children's writing and language arts activities. For example, the **Language Development Magnet School for Secondary Recent Immigrant Students** includes opportunities for parent education; communications from the school to the home; volunteers at school; interactions with children about school work at home; and parents in decision making roles. This program incorporates Epstein's (1987) five types of school and family connections. The unique feature is that the program serves students and families who recently immigrated to the U.S. and who speak little or no English. If this program can conceptualize and operationalize ambitious school and family connections, then any middle grades program can do the same. Students from the Language Development Magnet School are reported to enter regular schools with skills that place them at or beyond grade level, removing the disadvantage that often is associated with new immigrant status. The family-school connection is believed to contribute to the program's success in preparing students for regular schools.

Another example of ambitious school and family connections is project ELATE, in which parents are asked to help identify their children's needs, participate in home visits about the children's development and school programs, become volunteers, evaluate the program as their own child experiences it, become involved with children's leisure reading at home, discuss student report cards, and participate in parent-teacher conferences. Again, the five major types of parent involvement are implemented. Interestingly, promising programs in language arts and other subjects feature subject-specific parent involvement with their own children in learning activities at home -- the type of involvement parents request most of all (Dauber, et al., 1989; Epstein, 1986).

Language Arts Evaluation

The evaluation of language arts programs can be improved in several ways -- measuring different outcomes, measuring achievement in different ways, and measuring results for subgroups of students, particularly disadvantaged students. For example, the Language Development Magnet School for Secondary Recent Immigrant Students monitors several different tests of language skills instead of using only a general achievement test. These include criterion-based assessment instruments and techniques that are closely linked to the content and purpose of the program. ELATE measures achievement, self-esteem, and attendance to see how students are affected by the practices of the program.

Programs that include multiple components ultimately must conduct analyses to learn which parts of the program contribute to particular results. All programs need to provide better data on whether and how much disadvantaged learners who start out behind grade level accelerate their learning and catch up to their peers in writing and language skills.

Thinking Skills: Promising Programs for the Middle Grades

When educators use the term "high content" they tend to mean programs to teach students to think critically or creatively. The term is often used to make distinctions between basic or minimum competencies that require only memory or simple applications and. advanced or maximum competencies that require interpretations and complex applications. Although few "thinking skills" programs have been adequately evaluated, there are several programs and many materials that middle grades educators could consider to begin to increase the amount and kind of thinking that their students are asked to do.

Two main questions are debated about thinking skills programs. First, should thinking skills be taught as a separate subject or as part of each subject in the curriculum? Some programs integrate thinking skills in all subjects, whereas others focus students' attention on thinking and problem-solving as a separate subject. Careful evaluations are needed of which courses require and promote what types of knowledge, problem-solving abilities, or related thinking. There is some concern about the apparent lack of "generalizability" to other subjects when thinking is taught as a separate subject, and equal concern about the lack of development of general thinking skills when students are trained to think in math, science, social studies, or other specific subjects. This debate has not been resolved, but the current trend is to find ways to include thinking skills in every subject and, if time permits, to add extra classes or designated periods of existing subject classes to enliven and enrich the curriculum.

The second question is should thinking skills be taught to all students, only to those who have mastered basic skills, or only to the gifted or above average students? This issue is thoughtfully discussed by Presseisen (1988) who concludes: "For reasons rooted in international economic competition, global technological development, and changing demographic circumstances, educators suggest that every youngster needs to develop his or her abilities to solve problems, to examine issues and ideas critically, and to invent or creatively design new materials and solutions. ...(W)hat was once the province of the gifted and talented...has become a necessity for the entire school generation facing the twenty-first century." Promising programs tend to build thinking skills into the experiences of all students, including disadvantaged learners.

The two questions are linked. Some suggest that to think critically in a subject (e.g, history) a student must be bright, or on grade level, or "know a certain amount of history" (Adams, 1989). But, all students in a social studies (or other) class, regardless of their reading scores or scores on a history test, come into the class ready to think if helped to do so. In the middle grades, we cannot dismiss the value of adding thinking skills to each subject for all students just because some students are starting at a lower skill level. Thinking, discussing, and debating can be introduced to students who are thinking concretely or abstractly, on or off grade level, and in or out of specific subjects.

A third question, debated for a while, was: Should early adolescents be taught to think? A few researchers and philosophers advanced a notion that early adolescence was a time when students would not be able to do much thinking or show much cognitive development because of the nature and rate of brain growth during this period of life. Most researchers and educators challenged this assumption from the start, and Keating (1988) confirms "There is no persuasive evidence of fundamental constraints in the ability of early adolescents to engage in critical thinking."

Two types of "thinking" -- critical and creative -- are addressed by various programs. Critical thinking skills include problem-solving, decision making, other scientific reasoning skills, and reasoned judgments. Creative thinking skills include boosting students' abilities to generate ideas and think fluently, flexibly, originally, divergently, and elaboratively. There is some overlap in the two types of thinking in helping students solve problems, compare and contrast ideas, and distinguish among alternatives. But few critical thinking programs would include "relaxation exercises" to help students improve originality and flexibility of ideas (as in ICE's creative thinking activities, see program below). And few creative thinking programs stress deductive reasoning activities, as do all critical thinking programs.

Adams (1989) makes other distinctions between thinking skills programs that take a "macrological" or "micrological" approach. The former category includes critical and creative thinking programs that require students to consider multiple points of view and to interpret and apply complex information. The latter category includes abstract thinking programs that emphasize observations and classifications in relatively content-free aptitude exercises. These distinctions may help schools choose the types of activities they prefer for students.

"Macrological" programs feature activities that have no "right" answer and that require contemplation and discussion. In these programs, students are asked to raise and discuss such questions as: What if? Suppose that? From

whose perspective? What evidence do we have that? What would you imagine about? Teachers design and use "essential" questions that help students understand the world and their own place in it, such as: Who has authority to make decisions that affect our lives? and other questions that can organize interdisciplinary units of work (Lewis, 1989; Meier, 1989). "Micrological" programs feature activities that have "right" answers and that require thoughtful but focused solutions to problems or puzzles using words, symbols, or perception skills.

In the end, each district, school, or teacher must decide what they mean by "thinking skills" and what experiences in critical or creative thinking they want all middle grades students to have in separate classes or in all subjects.

Critical Thinking in all Subjects

Keating (1988) defines critical thinking as understanding something at a deeper rather than a superficial level, which requires the transformation or integration of information rather than the simple application of procedures. Several programs organize activities to increase critical thinking skills.

Improve Minimal Proficiencies by Activating Critical Thinking (IMPACT) guides the teaching of thinking in all content areas. It focuses on 22 thinking skills that can be infused in instructional strategies in all subjects. The program assumes that "students simply don't think at higher levels unless the teacher intentionally plans for this to happen." This, and all thinking skills programs, require strong staff development of middle grades teachers who may not previously have thought about how to teach thinking skills.

IMPACT emphasizes problem solving, decision making, and critical thinking in math, reading, and other classes. There is heavy emphasis on the students' responsibility for developing enabling skills, processing skills, and operations -- three levels of scientific thinking that comprise many specific subskills. The prototype activities use innovative "mind grabbers" that cleverly link a challenging thinking exercise with math, study skills, or other subjects. IMPACT comes squarely down on the side of thinking skills for all students, including disadvantaged students, in order to advance their school skills and success in all subjects. In one evaluation, students in IMPACT did measurably better than other students in reading, math, and on the Cornell Critical Thinking Test. The latter, however, is considered by some to be the equivalent of a reading or achievement test and may not measure thinking as a separate skill focus (Arter, & Salmon, 1987).

The Structure of Intellect (SOI) program aims to give attention to critical skills, reasoning, and creative thinking skills, although it appears to focus mainly on critical thinking and reasoning. It offers many activities for teachers to link thinking skills directly to math and to reading to improve students' abilities in these subjects. The program is organized as an extensive hierarchical continuum ranging from basic thinking to advanced thinking skills in reading and math for use across the grades, including the middle grades. The program developers believe SOI affects academic achievement, particularly in reading and math, but clear evaluations are needed of the effects of SOI on middle grades students.

Critical Thinking Handbook: A Guide for Remodelling Lesson Plans in Language Arts, Social Studies, and Science (Paul, Binker, Martin, Vetrano, & Kreklau, 1989) is a reference book for teachers in grades 6-9. It illustrates how lesson plans in different subjects could incorporate thinking skills. The book works much like a "master class" in music or dance. The authors show an original lesson, critique it in terms of how well it calls upon thinking skills, and then present a revised and improved lesson that is more likely to develop those skills. This should be useful to teachers who know that they want to add thinking skills to their classes, but need ideas of how to apply the concepts of critical thinking in the subjects they teach. The examples demonstrate that teachers do not have to change their curricula in order to write lessons that build students' analytic and creative skills in those subjects.

Creative Thinking in all Subjects

The **Institute for Creative Education (ICE)** is an NDN program that

integrates creative thinking into the content of all subjects. ICE includes about 125 exercises for K-6 and 130 for 7-12 that can be used or adapted by any teacher to increase students' experiences exploring alternative solutions to interesting problems, brainstorming to produce creative ideas, and other activities. Results of evaluations of ICE are difficult to interpret. Compared to others who are not in the program, students in ICE are said to improve in flexibility of thinking, originality, and elaboration of ideas, but many of the differences are minor. Other evaluations of ICE or other creative thinking programs are needed, but it is likely that students in these programs are at least exposed to novel and potentially motivating exercises.

Like other NDN programs, information about ICE may be obtained from NDN State Facilitators, but access to program materials usually requires in-service training and formal adoption procedures. Once training is completed, however, most thinking skills programs require few extra expenses other than teachers' time to develop their lessons. For example, although training and program evaluations for ICE cost between $4,000 and $11,000, the project developers suggest that teachers need only "a few arts and crafts supplies and recycled junk" to conduct the program in their classes.

Thinking Skills as a Separate Subject

Philosophy for Children aims to build students' critical thinking skills in reasoning, logic, reflective thinking and speaking, and other skills of comprehension, analysis, and problem-solving. Hundreds of exercises and discussion plans are provided for use or as examples. Teachers use the lessons in conjunction with specially written "novels" that the students read and discuss. The novels introduce and reintroduce philosophical themes as they apply to real world settings and problems. Although Philosophy for Children is designed as a separate subject, its developers believe that it also could replace present reading or language arts programs as a new interdisciplinary reading, language arts, and thinking curriculum. The program has been used with students of all abilities from grades three to eight.

Many quantitative studies have been conducted over more than a decade to evaluate Philosophy for Children. Evaluations have looked at students' reading and math achievement, creative thinking, rational behavior, formal and informal reasoning, discovering alternatives, logic, and other skills. Most of the studies show that students in the program gain on at least some measures from pre- to post-test, and in comparison to students not in the program, although the differences are often minor. Most studies have been conducted in classrooms where students are involved with Philosophy for Children for one or two years. Nevertheless, this program is one of the best evaluated and most often implemented of the thinking skills programs reviewed. It should be of interest to educators who are considering adding to their program a separate course or class in thinking skills or a replacement program that combines reading, writing, and thinking.

Another program that helps students think great thoughts, express ideas, and listen to each other is **The Touchstones Project**. Participation in Touchstones does not depend on student reading level, as each selection is read aloud before students discuss it. In a separate class period, Touchstones aims to increase students' abilities to express their own ideas, appreciate and resolve differences with others, and transfer these skills to other subjects and other settings. Teachers may select from among 30-50 philosophical selections at each of three levels of thinking for the middle grades. The selections refer to issues in different subjects (e.g., science, literature, art, math, and others). Students, not the teachers, are the discussion leaders.

As in most programs, some students enjoy Touchstones, others do not. Anecdotal descriptions of the program suggest that students in The Touchstones Project are more cooperative, ask more questions, and refer to their philosophical readings in other settings. But, recent empirical studies of the effects of the program show that there are few measurable results on attitudes or achievements of inner city middle grades students (McPartland, & Nettles, 1990). The goals of The Touchstones Project are not well defined and so it is not surprising that

measured results are elusive. Without a clear statement of clear goals from the developers and some evidence of results, most educators will have a hard time justifying the use of limited school time for this program.

Higher Order Thinking Skills (HOTS) combines computer-based activities with dialogues between students and teachers. HOTS was designed to replace Chapter 1 pull-out remedial instruction classes that stress drill and practice with computer-based adventures, games, stories, and other software that encourages thinking. The lessons depend heavily on teachers and students talking together and reasoning over problems and computer activities. Students are helped to learn to apply strategies for solving problems, make inferences from contexts, apply vocabulary and concepts in different contexts, and synthesize information from two or more sources -- all skills that could be useful to students in and out of the HOTS classroom. Originally designed for students in grades 4-6, the HOTS program can be used through the middle grades.

HOTS is a pull-out program with promise. Classes meet for 35 minutes a day for 1-2 years to provide students with the depth of thinking and speaking skills that should have long-term and general "pay off" for learning in all subjects.

The success of HOTS depends on teachers' abilities to use specific "scripts" to guide students' work. It is expected that heavy emphasis on problem-solving and inductive reasoning will contribute to disadvantaged students' self-confidence, awareness of their own abilities, and better performance in their regular subject classes. The program is said to appeal to students, who see it as something of a reward to attend the HOTS classes, whereas few students feel that way about most Chapter 1 classes.

Results reported by teachers who have used the program suggest that, in the short-term, students improve their self-confidence and speaking skills. Educators who have used the program give testimonies that students from HOTS classes score higher and have fewer discipline problems than similar non-HOTS students, and a few even make the honor roll and are redefined as "gifted." These testimonies are either hokum or hope for the future. Only the clearest, most rigorous evaluations will resolve the questions that are generated by such claims. Students in the program show significant spring-to-spring NCE gains on standardized achievement tests, but these are not studies of comparison groups. Clearer evaluations are needed of HOTS, as of other high cost programs.

HOTS provides comprehensive training for teachers in conducting Socratic dialogues, curriculum guides for teachers that include the full scripts of the discussions that they have with students, and computer software on which the lessons are based. The program is not inexpensive. Initial hardware and software are required along with a full or part-time teacher, aide, or other staff to conduct the program. After the initial investment, the major cost of the program is for personnel. New regulations encourage schools to use Chapter 1 funds to develop students' advanced skills and programs of high content. Educators will want to review the new Chapter 1 and other federal and state regulations to see if it is possible to invest in thinking skills programs and other programs that require large investments of staff, technology, or materials.

The HOTS program developer asks a difficult question: Why should a district spend money to buy hardware and software, and then use both in ways they weren't intended to be used? And, he answers that a "roundabout but sophisticated approach to using technology may improve the learning of at-risk students more than direct but simplistic routes." (Pogrow, 1990) Some educators will question the use of HOTS because it requires the investment of two years of students' time in challenging discussions about games, decisions, and questions in hopes of improving students' math and reading achievement. Some wonder if the program activities are too distant from its goals. Nevertheless, there is something provocative about a "gifted approach for at-risk students."

Cognitive Research Trust (CoRT) is a popular thinking skills program for the middle grades that may be conducted as a separate subject or as designated class periods within another subject (such as English or social

studies). It has grand goals of helping students consider all facts, develop wisdom with which to use new information, take broad views, and realize there is not always a "right" answer or clear decision for important questions about life.

CoRT helps students apply a thinking tool called PMI for Plus/Minus/Interesting that guides students to consider the good points, bad points, and interesting possibilities that might arise -- good or bad -- on any issue or problem. The goal is for students to increasingly raise the level of their thinking from simple awareness of issues and willingness to explore issues up to focused, deliberate, and fluent use of thinking skills to understand issues and make decisions. The program offers 60 lessons (6 sections or types of thinking with 10 lessons in each) that teachers can use in 30-35 minute periods. Teachers can adapt the process to use with issues that are pertinent for their own students. The author of CoRT presents no formal evaluation data, and studies of the benefits of this program for middle grades students clearly are needed.

CoRT is said to give low-ability students permission to think. The same could be said about any of the thinking skills programs in separate or regular subject classes if they are provided for all students, including disadvantaged students.

It is pretty clear that programs whose goals are abstract or unstated or many steps removed from the skills students are supposed to improve (as when discussions of philosophical themes are expected to affect general conflict resolution skills or students' math or reading test scores) are less likely to "succeed" on those goals, but may succeed very well on short-term goals that are more closely linked to the actual program activities. Thus, The Touchstones Project may help students think about new ideas and the contributions philosophers make to society long before it helps students effectively resolve peer conflicts that arise in an English class. Or, HOTS may help students talk more articulately with teachers and feel comfortable with difficult computer-based activities long before it affects math problem-solving skills on middle grades achievement tests.

Evaluating Thinking Skills

Many instruments purport to measure "thinking skills." Tests for critical thinking in the middle grades include the Cornell Critical Thinking Test, New Jersey Test of Reasoning Skills, the Ross Test of Higher Cognitive Processes, and others. Tests for creative thinking for the middle grades include the Torrence Test of Creative Thinking, Williams Creativity Assessment Package, and others. Two references on available tests include Developing Minds: A Resource Book for Teaching Thinking (Costa, 1985) and Assessing Higher Order Thinking Skills: A Consumer's Guide (Arter, et al., 1987).

The Consumer's Guide is a handbook that refers to about 60 tests of critical and creative thinking, many of which are useable in the middle grades. Some information on each test is provided, including the time needed to administer the test, psychometric data on reliability and validity, and other information. Missing is information on cost, and even more important, missing are critical evaluations of the quality of the tests. One general concern is that tests of thinking skills that require high reading skills may simply be alternative reading tests, and not effective measures of thinking which may be independent of reading.

Before educators select a test to measure the effects of critical thinking programs, they must decide how the activities or programs they implement are expected to affect thinking. For example, if thinking skills activities are imbedded in all or some academic subject classes, teachers may want to know whether students' thinking has improved in the particular subject more than whether the student has attained some general thinking skill. Adding challenging activities to science classes may first improve students' understanding of science. Science teachers may not be particularly or immediately concerned about whether science thinking skills affect middle grades students' thinking in social studies. Evaluations of thinking skills in specific subjects must compare the academic skills and other performance of students who did and did not have the thinking skills portion of the

curriculum, particularly on the types of knowledge or abilities that the thinking activities were designed to improve.

Summary: Thinking Skills

Educators may debate whether middle grades students need critical or creative thinking or both. Advocates of creative thinking programs stress that students should stretch their minds to create flexible, original "one-of-a-kind" ideas or responses -- things no one else would think of. Advocates of critical thinking programs stress that students should develop the analytic skills that enable them to think in ways that will help them to answer difficult questions on tests that measure "success." Most thinking skills programs (creative and critical) have secondary goals to increase students' self-confidence, participation in class, and ability to work with others.

Thinking skills tend to emphasize either puzzle solving that demands attention and perception to activities that have a "right" answer, or the development of wisdom to consider and solve or resolve difficult problems or issues that have no right answer. Which skill or skills do schools want students to develop?

Higher order skills are not necessarily unusual or profound. For example, U.S. students are weak in their ability to solve multi-step math problems measured in the National Assessment of Educational Progress (NAEP) tests. Two-step problems are part of every middle grades math text and require only that students have access to motivating, appropriate, and clear lessons on these skills. Similarly, in reading and social studies, U.S. students are said to be weak in their ability to synthesize facts and ideas from several sources. This is a basic reading comprehension activity well within the capabilities of all middle grades students to learn if teachers make full use of their existing texts and provide clear lessons on these skills.

Because of the lack of good evaluations, it is too early to know whether and how thinking skills courses or exercises affect middle grades students. It may be that thinking skills programs in the middle grades should be viewed as an early step on a long path of programs and experiences. Early adolescence is a time when most students move from concrete to abstract thinking abilities. Thus, thinking skills in the middle grades are part of a developmental process, and educators will want to weave many types of experiences into their programs for students. Like stretching exercises that precede athletic activities, thinking skills in the middle grades in varied forms -- creative, critical, applied, and abstract -- may help students stretch their readiness for more extensive thinking skills programs and activities in later years.

Science: Promising Programs in the Middle Grades

As in math, science instruction in the middle grades is mainly guided by the textbook series that is selected by schools or districts. In science, teachers need to fully utilize the best that is available in texts and in many other resources to keep science current and exciting. Some promising supplementary programs suggest ways that all schools can raise the quality of science teaching and learning for all students, including disadvantaged students.

Some new programs may dramatically change science curricula and students' experiences in science in the middle grades. The most promising supplements and alternatives focus on active learning -- helping students work as scientists with laboratory activities in classrooms, in the community, or on computers. Another promising direction is interdisciplinary science instruction, which links science with health, social sciences, reading, writing, math, art, or other subjects based on concepts, issues, and problems that are important in the lives of early adolescents.

Active Learning in Science

Informal Science Study for grades 5-12 takes an innovative approach by focusing on science in non-school settings and activities. Students study the "physics of fun" as

demonstrated in amusement parks, games and sports, toys, and other play situations. The activities include the study of motion, acceleration, force, gravity, time, graphing, energy conservation, motion, physiology, and other concepts. Although the prototype materials in this program appear complicated, they provide science teachers or department chairs, or others engaged in science curriculum revisions with many ideas about how to relate real world experiences to important concepts in science. The Informal Science Study units could be reviewed to see what can be adopted or adapted to fit the curriculum objectives of other districts and schools. Formal evaluations have not been conducted, but the program developers suggest that evaluations show that students who experience Informal Science Study gain in their knowledge, comprehension, and applications of the topics they study.

Foundational Approaches in Science Teaching (FAST) includes topics of ecology and the environment for grades 6-8, matter and energy for grades 8-10, and general science for the high school grades. The program emphasizes lab skills and active learning and requires minimal classroom facilities -- heat, running water, and bench space. The program reports modest but consistent gains in students' abilities to do lab work compared to other approaches. This does not necessarily translate into increased knowledge of ecology, energy, or general science compared to students who study these topics in traditional ways. Nevertheless, many middle grades students spend years in elementary school with little or no "lab work," and may benefit from supplementary programs that provide these experiences. The available lessons in FAST or other supplementary programs should provide science teachers with ideas even if the program is not be adopted outright.

Marine Science Project: FOR SEA illustrates how improved science programs can be developed around topics of local importance and extended for their national implications. The materials in this program include intriguing lessons in marine science in biology and oceanography for the middle grades. Marine Science Project: FOR SEA includes 90 instructional hours of lessons (5 hours for 18 weeks). This program has been well evaluated, despite its single focus. Students in the program gain more in their knowledge of marine science than students in control groups. Similar results were found for students who lived near an ocean and those who lived inland, suggesting that the program is generally useful for helping all students understand the nature, importance, and problems of marine life.

Similarly, the program **Survival Strategies** is based on lessons that are conducted in class and (where available) at a zoo in biology, conservation, and animal populations. Regardless of the availability of a zoo, however, middle grades teachers may want students to consider serious questions of wildlife and conservation as part of a science program that is relevant to early adolescents' interests. Survival Strategies asks students to consider: Will wildlife as we know it survive through the 21st century? The students study life cycles of populations of animals, competition and predation, and other topics. The program concludes with a simulation game in which students manage a wildlife refuge.

Programs like Marine Science Project: FOR SEA and Survival Strategies should be collected and reviewed by committees of science teachers and other curriculum leaders to find exciting and challenging supplements to science textbooks, or to spark teachers' ideas to develop similar approaches for other science topics. The goal is to enrich middle grades science with active learning exercises that students conduct in class, at home, with their families or friends on weekends, or in other ways.

Interdisciplinary Science Program

One promising program that should be available soon is Stanford University's **Middle Grades Human Biology Curriculum Project**. This program builds on middle grades students' interests in their bodies, their emotions, and their lives during adolescence. The program links studies about physical development, social systems, ecology, history, psychology, and other aspects of health in an interdisciplinary life sciences perspective. It also includes a comprehensive set of teacher training materials to bring teachers up to date in science knowledge in the biological and social sciences that are covered

in the curriculum for students. This program offers a full curriculum designed to provide students with a strong base of science knowledge and positive attitudes in the middle grades and to encourage students to take science courses in high school. The units of work emphasize learning by doing, active thinking, and working as a scientist. The curriculum promises to be a high-powered, thoughtful program.

Educators will want to carefully review the early evaluations of the effects of the Human Biology Curriculum Project on middle grades students' science knowledge and attitudes. The program will probably be available for use before it is fully evaluated. If so, educators need to carefully "guess-timate" how the curriculum compares to their present science program, and how it fits in as a one-, two-, or three-year program or as a supplementary program.

Science and Technology

Another promising direction in science is computer-based instruction that permits students to conduct science experiments on computers that would be otherwise impossible to conduct in most middle grades laboratories or classrooms. Computer-based "experiments" should not take the place of all lab work, because students need to see, smell, and feel science. Programs like **The Education Systems Corporation (ESC) Explorations in Middle School Science** may, however, greatly enrich students' investigations and understanding of many topics.

ESC Explorations in Middle School Science includes 30 interactive computer simulations on space, atoms and matter, mechanics, energy, electricity, and others to supplement most physical science textbook series. In the program, teachers are helped to link science to reading, writing, and math as students observe, hypothesize, experiment, collect, analyze, and report data. This program is costly because of hardware and software requirements. It needs to be carefully evaluated, but it looks particularly promising for adding new and high content to middle grades science classes. Other computer-based science programs from other companies (as well as new directions in computer-based instruction in other subjects) should be compared with ESC by educators who are considering for making large financial investments in new content curricula in the middle grades.

Staff Development to Supplement Science Programs

When new units of work are needed, science supervisors and teachers must be given time to work together to design, select, adapt, test, and improve activities. In other words, they need time to act as scientists themselves and to translate their work into perspectives, units, and lessons for students. If teachers were helped by school and district administrators to become more proficient scientists or science thinkers, and if they actively prepared or adapted curricula and instructional approaches, students would see what it means to work as a scientist, how science captivates adults, and how students can join in. The professionalization of teachers in their special field is one of the recurring components of promising programs in all subjects.

If new programs are adopted, teachers will need traditional staff development to assure their understanding of the new approaches and their abilities to fully implement the programs.

Evaluating Science Programs

Science teachers and supervisors selecting new or supplementary science programs need evidence that promising programs will help their middle grades students learn and like science better than their present programs and better than other alternatives. Data of this sort are not readily available for most programs.

Although almost all middle grades schools give students standardized tests in reading and math, few schools regularly measure or monitor students' progress in science or compare their own school's success in science with others in the district, state, or nation. One result of this is that reading, English, and math are given greater importance in middle grades programs than is science. A few districts are beginning to add standardized or criterion-based science achievement tests to their test schedules.

Other science indicators -- attitudes toward science and lab skills -- also are

important. Standardized and other tests of science knowledge may not be immediately affected by science programs that stress active learning. But, students' involvement in doing science and being scientists may increase the likelihood that they will enjoy science and continue taking more science courses. In the middle grades, science activities may be as important as science facts. Educators need to improve science content and instructional approaches to make science so interesting to students that they will stay in science courses through high school. Evaluations need to include measures of continued commitment to science, in addition to measures of skills and attitudes.

Social Studies: Promising Programs in the Middle Grades

Promising programs in social studies take several different directions. Supplementary activities to use with textbooks and new programs to replace present texts emphasize active learning by students and participation in research and community service. Social studies teachers and curriculum leaders seem to agree that new high content will be added to social studies by increasing students' reflection on and discussion of alternative and multicultural perspectives of history, current events, and geographic issues; and by increasing the use of original source documents, maps, diaries, and other materials that help history and geography come alive for students. Interdisciplinary units are being developed to integrate history, art, music, English, and other subjects that are presently in the students' curriculum. On the horizon are programs that introduce new content in the social sciences -- anthropology, sociology, psychology, and other fields that relate directly to history.

Multicultural Education in Social Studies

Respecting Ethnic and Cultural Heritage (REACH) offers four booklets on U. S. History from the perspectives of Black Americans, Mexican Americans/Chicanos, Asian Americans, and American Indians. The booklets are short and readable, and not only convey history but also provide ideas for discussion that should be of interest to early adolescents. The evaluations of this project suggest that students' ethnic awareness and acceptance of others are improved as a result of the program. Other evaluations of these outcomes and knowledge of U.S. history are needed.

There is much talk about the importance of multicultural curricula in the middle grades and little evidence of it in most programs because of a lack of materials and tested approaches. REACH, designed for use over thirty to forty class periods, may offer some good ideas and examples. Social studies curriculum supervisors and teachers may want to use the program as designed or revise the approach to fit their own curricular objectives and time schedules.

Facing History and Ourselves: Holocaust and Human Behavior is a program that introduces middle grades or high school students to the history, human drama, and themes of the Holocaust, Armenian genocide, the atom bomb in Hiroshima, and other issues of unusual magnitude. The program is designed to enrich and supplement middle or high school social studies curricula. The NDN program provides training for teachers and a textbook for students.

It brings to students' attention the importance in 20th century history of ethics, social attitudes and behavior, and an understanding of major contemporary issues -- racism, violence, prejudice, abuse of power, human rights, morality, law, and citizenship. The students address questions such as: What are the conditions that create a just society? How do people treat each other? Should rules set by authorities ever be broken? What would, should, could I have done in a situation like the Holocaust, or in present day situations that promote discrimination, prejudice, or general unfairness? Students ask and discuss hard questions, raising the level of thinking about social studies. As in many other promising programs, the teacher is involved as a learner and thinker. The program does not report formal

evaluations but has many testimonies from teachers, students, and parents who say the program helps students think in new and important ways. More pertinent evaluations are needed, particularly of how the program affects middle vs. high school students' awareness and understanding of different concepts.

Social studies resources for multicultural curricula are available from many organizations that specialize in the teaching of history, geography, social sciences, and related topics. For example, The Center for Teaching International Relations (1989) offers supplementary resources for social studies programs with prototype lessons about the future, human rights, understanding conflict, Africa, China, Japan, and other cultures, ethnic heritage, and other topics.

Economics in Social Studies

Ideas and materials are available from the Joint Council on Economic Education (1989). This organization's catalogue for teachers contains resources to supplement regular social studies programs, which typically ignore economic concepts and activities. The units include audio-visuals, instructional TV, computer-assisted instruction, and other technologies and methods to teach the stock market, the economics of agriculture, and other topics.

Student Participation in the Community

The Civic Achievement Award Program (CAAP) in Honor of the Office of the Speaker of the House of Representatives is a promising resource for social studies teachers in grades 5-8. In CAAP, students study U. S. history, cultural diversity, governmental legislation, and other facts and processes, and then use their knowledge to conduct individual or group research projects. Students then proceed to design and conduct community action projects. The program packets include two soft-cover books for students, one at the fifth grade and the other at the seventh grade reading level. The two books cover similar content, with slightly more detail offered at the higher reading level. This enables a teacher to use the program in a heterogeneous social studies class that includes students with a range of reading skills. Importantly, the program includes built-in rewards and recognitions for students who contribute to their community with their action projects. The research and citizen participation activities allow teachers to integrate reading, writing, speaking, science, art, and other subjects into their social studies units.

Of all of the academic subjects, social studies requires students to work in heterogeneous classes with students of all abilities, just as students will live and work with diversity in society. To conduct effective lessons with heterogeneous groups, teachers need instructional materials for weak and strong readers that cover the same content so that students with diverse reading abilities can think and work together. CAAP workbooks provide one example for U.S. history in the middle grades that solves this problem. School and district social studies teams could consider similar approaches for other social studies topics in the middle grades.

Law in a Changing Society (LCS) is a program to improve students' citizenship skills and to increase their understanding of the law and legal institutions. Social studies teachers are provided training and information on these topics and materials for students to learn about the law, the constitution, and city government, and to participate in a mock trial. Developed for grades 4 and 5, the program and approach could be adapted with considerable revisions for middle grades units in which government and citizenship are prominent topics. A mock trial is a useful prototype that would be quite appropriate in the middle grades. Early evaluations show that the program increases students' knowledge about the law and promotes more positive attitudes toward law enforcement. The evaluations are not satisfactory, however, for determining LCS's potential in the middle grades.

Social Studies and Family Involvement

Teachers Involve Parents in Schoolwork (TIPS) Social Studies and Art links art history and criticism to middle grades social studies curricula in American

History, World Cultures, and Government and Citizen Participation. TIPS Social Studies and Art involves parents or other volunteers to present and discuss the art work in social studies classes. Each month, the volunteers discuss a new art print with the class and leave the print in the room until the next visit. Teachers follow up the discussion with class work, homework, or extra credit activities about the art print as it links to social studies. An evaluation of the program shows that students in the program increase their awareness of artists and their work, and about 80% of the students develop likes and dislikes of the prints they see. Parent volunteers were successful in the middle grades in ways that assisted teachers and students to increase the content of the curriculum.

Interdisciplinary units in the middle grades are recommended to introduce students to natural and important connections across subjects, but these units take time to develop. TIPS Social Studies and Art materials and the involvement of parents and other volunteers help teachers enrich students' experiences with connections between these two subjects. The process can be adapted to other middle grades social studies units, or to other curricula (such as language arts or foreign language).

In addition to involving parents as volunteers in social studies classes, there are many ways that teachers can inform and involve parents in students' social studies work at home. Epstein suggests that every teacher in every subject can design at least one homework assignment a month that requires students to talk to someone at home about something interesting (Brandt, 1989). In social studies, students can be assigned homework that requires them to interview, survey, and obtain reactions from parents or other family members about history, current events, government, economics, natural resources, and other topics.

Staff Development in Social Studies

Resource lists and catalogues are available from many sources, including those mentioned here. But, teachers cannot thoughtfully use resources without a supportive administrative structure that provides the time and incentives to develop better programs. Along with "staff development" in the usual sense of workshops and instruction, teachers need staff development that offers time and support to work together to gather materials and to develop coherent and enriching units of high content instruction.

Promising Programs that Combine Components

Many of the programs discussed above in math, reading, language arts, and other subjects include many different components. The different features of programs may either be critical, or marginally important, or superfluous to students' success. In this section, we examine total school programs that combine many components. Whether in specific subjects, or in programs that affect a whole school, or in comprehensive programs for disadvantaged students, the questions about multiple components are the same: Which components should be included and which are dispensable? Which affect what outcomes for what students? Which complement and strengthen each other? Not all programs can be fully funded and so not all components of promising programs can always be included when a school adopts or adapts new approaches. Thus component analyses are imperative, but they are usually missing from program evaluations.

Project Promise at James P. Timilty Middle School adds 90 minutes to the school day and 3 hours of school on Saturday to increase the learning time of students who are at risk of failing. The program includes teams of teachers, flexible scheduling, and interdisciplinary work -- particularly integrating reading, math, and writing in all subjects. The program's promise is that all students will be working at or beyond grade level if they do the work specified for the program. The principal has the power to select teachers and to dramatically change (or waive) school rules and practices. The staff is given 45 minutes a day and 2 hours on Fridays for planning and staff development. Like many promising programs, it is neither teacher-

centered, student-centered, nor directed by the principal as the sole leader, but creates a community for learning in which students are assisted and teachers are supported as professionals.

Project Promise combines many components. Evaluations are needed that inform educators about which components are most important for increasing the success of students at risk of failing: strong leadership? extra time for students? extra time for teachers? smaller class size? heavy focus on academics? or others? The leadership of the district stated, "An evaluation of all three schools in the program is due...but it is not an evaluation designed to identify what might be applicable system-wide. There are no plans to undertake such a study."

The cost of the program at Timilty Middle School is about $1000 more per pupil than at regular middle schools in the district -- a cost that the district believes it cannot afford in all schools. However, without information on the contributions of particular components of the program, other schools cannot learn which low-cost or high-cost features are responsible for the ostensible success of Project Promise, or decide which practices they can afford that will benefit their students.

Project Promise not only illustrates how components from other promising programs can be combined, but also illustrates unfortunate attitudes toward evaluation in many schools, districts, and states that prevent educators from learning about the payoffs of their investments in program development and implementation.

Another attempt to organize an effective pull-out treatment program is **4 Success**, conducted at the elementary level, but adaptable to the middle grades. Although it is called a "non-pull-out program" because the students are not pulled out of their classroom to go for extra help, the class is an "already pulled-out " homogeneous group of students who are most at-risk academically. In effect, the students have been "pulled in" to a separate class or "track" to work toward grade level. Two teachers -- one regular and one remedial -- work together in a "success class" to give students extra attention, appropriate lessons, and support in all subjects. Similar programs in middle schools provide remedial instruction, learning opportunities, and support to small groups of students most in need of help. Some of these programs report, anecdotally, that they are so positively organized that students who are in the program do not want to leave the class even when they are eligible to return to a regular classroom.

This approach puts special remedial classes in the same light as those for gifted students -- as opportunities to learn in an enriched environment with teachers who want to teach the class. The difference is that, in traditional practice, gifted and talented programs are viewed as enrichment programs to accelerate the learning of the already accelerated, while remedial instruction programs are usually viewed as treatment programs that often decelerate the learning of the already decelerated. Promising programs, like 4 Success, take the same approach as the gifted and talented special classes and accelerate the learning of disadvantaged students.

It is possible that in some schools, "success" classes are needed to give unusual resources, attention, and hope to small groups of students who are failing or are greatly at-risk. And it is possible that in some schools, these classes are highly successful. But euphemisms for "tracking" -- even for small, select groups of students -- should not be taken lightly.

Promising programs for treating unusual needs are intensive and combine many components, such as the **Language Development Magnet School**, an alternative temporary school for new immigrant students in the middle and high school grades. Students with average or higher intelligence who lack English language skills often are labeled in regular schools as "slow" or "disadvantaged," with serious negative consequences for the students' self-esteem and motivation to learn in school. The Language Development Magnet School provides before, during, and after-school tutoring; teachers are available on a "hotline" to provide homework help; and computers are used to vary teaching and learning approaches. Students' linguistic, emotional, and social needs are addressed, in addition to their academic needs. Social support is built into the program as peers, teachers, and parents all encourage students to work hard, build skills, and prepare

for placement in regular middle and high schools. As impressive as the program is, it is not possible to know which of the many components of the program contribute to students' successes in the alternative school and successful transitions to regular schools.

Summer Training and Education Program (STEP) is a promising program that was evaluated by Public/Private Ventures (P/PV) to see if consecutive, intensive summer learning activities combined with work experience and follow-ups during the school year could increase student success in school and help stem the learning losses that often occur over the summer, particularly for disadvantaged students. The program includes education, community service, outdoor adventure, career internships, and other features to appeal to students who might otherwise lose interest in schooling. Evaluations of STEP show that, in the short-term, students in the program develop social and personal responsibility, self-esteem, and more positive attitudes toward school and adults as a result of community service, community study, and career internships. The long term effects of the program and the importance of particular components of the program are not yet clear.

Project Promise is a comprehensive program that combines many components to dramatically restructure school time, staff selection, staff planning, and remedial instruction. The Language Development Magnet School and STEP are other examples of programs that combine many components to redesign schooling across subjects in the middle grades. It will be very important over the next few years to evaluate promising middle grades practices to determine which are successful, for which students, at what cost, and compared to what alternatives. This is necessary to justify the cost of comprehensive programs such as Project Promise, to determine needed revisions to programs such as STEP, and to validate the worth of specific subject programs discussed in earlier sections of this paper. Only with a menu of approaches and better information about likely effects will most middle grades schools change their present practices to institute more effective programs for disadvantaged middle grades students (Epstein, & Mac Iver, 1990).

Conflicting Components

As educators examine the many components in different promising programs in math, reading, social studies, and other subjects, they will notice that some seem to contradict each other, others complement each other, and still others work independently. This section discusses some of the issues and questions raised by conflicting components or those that must complement each other in a high content program for disadvantaged students. These are important dilemmas that must be discussed and resolved by educators as they consider which of several programs they might adopt or adapt.

Core or Common Curriculum vs. Meeting Students' Diverse Needs?

Some promising programs help educators give all students the same experiences -- a common curriculum. Other programs aim to meet the unique and individual needs of students and the learning problems of individuals. These two approaches set two different but important goals. A common curriculum aims to help all students keep options open for future work in high school and post-secondary education. Individualized curriculum and treatment programs aim to understand and serve student diversity by accepting students at their present starting place and helping them progress from there. Individualized programs also may be designed to build unique talents and skills on which students differ from each other to open different options in high school and post-secondary education. When decisions are made to offer students a "common curriculum" in the middle grades, educators need to consider how they also will provide for the diversity in students' learning rates, learning styles, and the uniqueness of students' interests and talents. When decisions are made to individualize regular or remedial instruction, educators need to consider whether they are, in effect, closing students' options for later education and occupational choices.

More Time vs. Different Use of Time?

A related dilemma is how time is allocated for learning. Some students need more time to master required or advanced skills. Yet most middle grades schools set 45-55 minute periods in which all students are required to learn the lesson and complete their work. Educators need to consider: Do all subjects require the same time allocations? Do all students need the same time or varied time to learn? Schools need to consider whether, when, or why to create programs that allow students flexible time to work, and whether, when, or why to require all students to finish their work in the same amount of time.

A similar problem is raised in regular and remedial classes. If students need extra help, is it scheduled in school during regular class time? in school during elective or extra class periods? or during extended days or other times for learning? Are the minutes of a school day presently arranged to help disadvantaged students learn their work, apply knowledge, and pass their courses? Or, is time allocated to accommodate successful students?

More time and extra time are not the only answers for more effective programs for disadvantaged students in the middle grades. New approaches are needed that make all time in school more motivating and challenging for all students, whether they are learning new skills for the first time or working at skills that they missed the first time they were taught. For example, one promising program considers the lack of time as the major cause of student failure and links new time structures with new evaluation structures in a no-fail grading process that encourages continuous and successful progress.

In the **Fresh Start Minischool** -- a high school dropout prevention alternative program -- students are expected to meet high standards and fulfill requirements in all courses, but their report card grades are limited to marks of Mastery, Satisfactory, and In Progress. "In Progress" indicates that the students have not completed a course satisfactorily, but that they and their teachers are working on needed skills and requirements. These grades can be translated to A or B, and C for levels of passing, but no D's or F's are awarded. All IP's (incomplete work that is In Progress) must be completed before the student graduates from the school.

The Fresh Start Minischool was an interesting experiment that combined no-fail grading with counseling, home visits and other connections with families, extra tutoring, and enrichment activities. It is impossible to tell which component of the program contributed to the apparent success of many students in the program. Evaluations of the program show that over 60% of the treatment students had at least one IP instead of a failing grade after 1 year. Course credit, not time, became the main issue. More students in the program stayed in school and were graduated than did students in a randomly assigned control group.

The no-fail grading process revises how students perceive their work and their worth as students by providing them with more time to master required skills. This process may be more easily applied in the middle grades than in the high school grades where it originated. It may be a particularly powerful motivating force for disadvantaged middle grades students working on high content curricula.

Basic Skills vs. Advanced Thinking Skills?

Basic skills and advanced skills are part of a continuum of knowledge in an education of "high content." Promising programs treat basic skills as high content by eliminating rote memorization and empty applications. Promising programs treat advanced thinking skills as high content as a separate subject or as part of all subjects by including exercises to improve students' critical and creative thinking. Schools must decide who will have access to basic and advanced skills, and how all skills will be taught to help students understand the importance, application, and extension of what they learn.

High Standards vs. No Retentions

There is strong agreement that schools must set and keep high standards, so that students know they are working toward goals

that matter. At the same time, there is general agreement that retaining students to repeat a grade because of failure does little good for students' motivation to work, learn, or stay in school. When students are removed from their cohort of peers and friends, the label of "repeater" or "failure" can be worse than the label associated with remedial instruction.

Promising programs aim to reduce or eliminate the need for students to repeat a grade by the design and delivery of remedial instruction. Extra teachers, adult volunteers, peer tutors, coaching classes before or after school, or extra periods of instruction during the school day that do not remove students from their regular classes are among the competing or complementary components of promising programs. Many evaluations need to be conducted to learn which components successfully help prevent failure and retentions.

Promising programs are organized so that students receive help before they fail (to fix before they flunk) so that students can accelerate learning to make up lost ground. Some allow students to make up two years of work in one in order to return to their original cohort. Others allow students to repeat only the course(s) they failed and not the whole grade. Still others are designed as true alternative programs so that if, in the final analysis, students must repeat a grade, it is offered with different instructional approaches and by different teachers.

Start Small vs. Change All Classes or All Schools at Once?

Leaders at school and district levels debate about whether an innovative program or practice should be instituted in a few demonstration schools, or in all schools at the same time. Most promising programs begin in one or a few schools under close supervision. If a program does not work in a selected school, or if it needs to be fine tuned, tailored, or revised for particular subgroups of students, it pays to find out with some pilot or demonstration cases, before large investments are made in materials and staff development. Yet, many districts and schools want all schools or all grade levels within a school to adopt new programs and approaches at the same time. This assumes that having all teachers and administrators share a common perspective and common goals will be an advantage. Or, it assumes that some schools, students, families, or teachers will feel shortchanged if they are not given new resources or programs at exactly the same time as other schools. Or practical reasons intervene, as when vendors give discounts for large district-wide orders of equipment or materials.

Probably, a mix of pilot projects, school-wide projects, and total district programs are needed. The default on decisions about new programs, however, should be to start small, unless clear and convincing evaluations direct widespread adoptions. Over time, effective demonstrations may become total school or district programs.

III. Discussion

In our search for promising programs, over 300 were reviewed. Over 200 of these were related to the content areas discussed in this paper -- math, reading, writing and language arts, thinking skills, science, social studies, and comprehensive programs. Of these, about 80 were found to have some promising components that could be of use to middle grades educators to raise the content of the education of all students, and particularly of disadvantaged students. The programs are discussed briefly in the text and listed in the Appendix. Because of serious weaknesses in evaluations however, the programs cannot be recommended without qualification. Rather, middle grades educators will have to review many available programs and decide which ones offer ideas and procedures that can be helpful in their own schools and that meet the needs of their students.

Common Themes

Several themes recur in promising programs for the middle grades that may be

particularly important for increasing high content education for disadvantaged students.

All students can learn. This assumption has become something of a cliche, but in its best meaning this is the basis of all promising programs to improve the skills of educationally disadvantaged students.

Commitment counts. Many promising programs require pledges or other "sign up" forms from students and, sometimes, from parents. Students are asked to acknowledge from the outset that they will do their part to succeed in the program. The formal pledge officially assigns students some responsibilities for their own learning, just as it assigns schools the responsibility to implement programs well. When parents are asked to sign permissions for their children to enter remedial or special programs, they are more likely to be receptive to messages from the school about their child's progress or needs in the program and to provide support at home when guided on how to do so.

Selection procedures that require pledges of commitment may be perceived as "stacking the odds" for the program by including only those students and families willing to work hard. However, formal commitment may help students focus their attention on schoolwork. A similar tack is taken when teachers in any class ask students to design and sign "contracts" that outline the work students must do to earn a grade of A, B, or C. Evaluations need to pay attention to components like pledges and permissions to see if they contribute to the programs' and students' success.

Pull-out programs are not all bad, but they are not all good either. There are benefits and disadvantages to pull-out programs for remedial instruction in the middle grades. It is necessary to give students extra help when they fall behind grade level. It also is necessary to limit the effects of labeling that occur when students are singled out for their weaknesses. This is a dilemma for students who want help but do not want to be identified as "dumb" or "slow." It is a dilemma, too, for schools that want to provide appropriate instruction for all students but also want to limit labeling and maintain or increase students' self-esteem.

There are promising programs that pull middle grades students out of their classes for special assistance, or put students in separate classes, or offer students extra classes for remedial work, but schools need to design these programs carefully. In the middle grades, extra planning is needed so that pull-out programs do not disrupt classes and do not negatively label students who receive special services. Many pull-out programs are designed to provide students with extra or unusual resources, materials, and personal attention. In many programs, teachers and supervisors are trained in ways to motivate, recognize, and appreciate students who are slower than others in their rates or styles of learning. These teachers have clear plans for helping students move incrementally from their own starting points to grade level mastery.

Some pull-out or special assignment programs make membership and participation a reward and honor. Students in these programs are supported by teachers and peers and not ridiculed for their unique needs, are recognized for their selection in the program, and are informed about the program's goals, the teachers' objectives, and the students' responsibilities. The students are recognized and rewarded for the progress they make, just as students are in other classes. When organized along these lines, remedial instruction need not be punishment for students who need extra help nor for their teachers. Rather, these programs may be the ones that redirect students who had lost all hope of success in school.

But warnings must be attached to all pull-out or pull-in programs. A class composed of students at risk for whom extra services are mobilized in new and motivating ways is, for all practical purposes, a pull-out program with students "tracked" or grouped by ability. The fact that students are not pulled out of the class for remedial work does not change the special group assignment. Pull-out programs require extra investments in staff, instructional materials, and other support to reach the treatment goals, and careful evaluations must be conducted to determine whether this is a solution to or perpetuation of the students' learning problems.

Each school is a community of active learners in which students, teachers, administrators, parents, and others are involved in building new knowledge, important skills, and shared perspectives. Promising programs engage principals, teachers, and students as active learners, actors, and interactors. This description -- "the school as a community of active learners" -- may characterize high content programs more than other popular labels such as "teacher-centered" or "student-centered" schools, or labels that set the principal apart as "the instructional leader."

"Teacher-centered" programs that focus on active teaching emphasize the teacher doing the job well, covering the curriculum, using effective teaching strategies, maximizing instructional time, and conducting excellent classes as defined pedagogically in terms of the teachers' organization and use of teaching time. Programs that stress active teaching or that tightly organize direct instruction place less emphasis on how students learn differently, and more emphasis on standardizing teaching behaviors.

"Student-centered" programs that focus on active learning emphasize the students' involvement in learning. The school is responsible for providing learning opportunities and school services that match students' developmental characteristics and unique or individual needs. Student-centered programs that too narrowly match school experiences with student needs may appear over-solicitous and unchallenging. They may not provide the high content and challenging demands that motivate students toward maximum growth in learning or commitment to school.

When middle grades principals are defined as the instructional leaders of the school, they are expected to know all, including the best ways to teach all subjects, organize classrooms, budgets, and schedules, discipline students, interact with families, and other skills. Of course, principals are not experts in all subjects that are taught in the middle grades. Although principals serve vital leadership roles, the "instructional leader" model often negates the teachers' roles in school and classroom decisions. Schools that overemphasize the principal as instructional leader, not only limit teachers to subordinate roles, but also avoid involving students and parents as contributors to school leadership, decisions, and school improvement efforts.

Programs that build a community of active learners combine the best aspects of active teaching, active learning, and principals as leaders (Barth, 1990; Carnegie Task Force on the Education of Young Adolescents, 1989; Lewis, 1989; Meier, 1989; Monroe, 1989). Teachers in these programs think, learn, conduct research, and work with other teachers and with students to develop and improve curricula and learning experiences. Students in these programs not only are active learners and peer teachers, but also observe their teachers as experts, resources, and adult learners. Students see teachers working together to solve problems, advancing their own knowledge, and working with students to make learning exciting and rewarding. Principals in these programs lead by example. With teachers, parents, and students, principals in an active learning community draw on others' expertise, and share personal talents and wisdom to improve the school program for all students.

One example of a school working on this principle is **Central Park East Secondary School** which bases its program on the concept of "student as worker" and teachers as coaches, partners, and participants in learning. The program was designed by principal Deborah Meier to demonstrate that inner city students in public schools can conduct important learning activities in a caring and challenging environment where teachers work as professionals, problem solvers, and learners.

When educators recommend that all students should have access to high content and advanced courses, they are recognizing that in most schools, students in low-ability classes are offered less interesting and less challenging work than students in high-ability classes. Schools that establish all classrooms as communities of active learners provide high interest and challenging work for all students and all staff.

Both prevention and treatment programs are needed in the middle grades for effective programs for disadvantaged students. Prevention of serious learning problems is the first and main concern of all programs to improve schooling for all students. Good programs that

help students learn and make continuous progress typically include new and better curricula and materials, new instructional approaches and other features of state of the art curricula that emphasize active learning, many opportunities for students to receive rewards and recognition of progress, new technologies, extra staff and staff development, improved student-teacher interactions, and other practices. The programs operate on the premise that a good program will take students in new directions, will not create new learning problems, and can help students advance or accelerate learning.

Treatment of serious learning problems is a safety net for students. There will always be a few students who, even in excellent programs, fall behind due to personal, social, and other difficulties. Corrections of serious learning problems require unique and sometimes extreme and innovative approaches. Many programs respond with diagnostic, individualized programs to help prevent students from failing courses, repeating grades, or dropping out of school. Students must be motivated to work on skills that they did not learn the first time they were taught. Treatment programs need extra staff, responsive technologies, varied materials, and resources to individualize instruction, such as computer-assisted instruction and other approaches that allow students to move quickly through a sequence of skills at their own pace.

Promising treatment programs for educationally disadvantaged students aim to help students catch up to their peers without totally separating them psychologically or socially from the rest of their classmates. Promising treatment programs establish a "social organization of remediation" (Epstein, 1988) to accompany the academic organization of remedial instruction. The "social organization of remediation" builds into remedial instruction not only the academic content of a lesson, but also a social support system from teachers, peers, and parents that makes it acceptable to seek and to receive remedial instruction. It is something of a trick to provide intensive "treatment" in ways that raise students' self-esteem and expectations for themselves. A medical analogy makes the point: treatment for serious medical problems requires not only the medicine (the academic dosage or content) but also the personal commitment and social and psychological support to see the treatment through.

Promising programs evaluate whether they reach the goals they set. This project originated as a search for "effective" programs, but because of the low quality of evaluation designs and data, was downgraded to a search for "promising" programs. Many sections of this paper discuss how to improve the quality of program evaluations so that the efforts and investments in implementations yield good information for judging whether the program is successful in helping disadvantaged students succeed in school. Presently, most programs cannot know whether or not they are reaching the goals they set. Nor can other potential users know whether, how, or for whom one program is better than another.

Lipsitz (1984) calls for "order and joy" in balanced middle grades programs that challenge and support students. Many schools set multiple goals for students, including achievements, attitudes, self-esteem, and other outcomes that indicate success as a student and as an early adolescent. If goals are set, it is necessary to determine if goals are reached. These evaluations may use many different methods -- quantitative and qualitative. Standardized and criterion-based tests help schools monitor and compare student achievements. Other evaluation procedures also are needed that allow students to demonstrate their knowledge. Surveys, interviews, and observations help schools assess student attitudes, self-esteem, and other affective responses.

There is no shortage of new ideas for and from teachers, but without clear documentation and systematic evaluations, one bright idea is as appealing and seemingly valid as the next. Only with better evaluation information in the future will educators be able to purposefully choose among programs to meet the needs of the students in their schools.

Conclusion

Educators are aware that when educational disadvantage is coupled with economic disadvantage, students' problems are more than doubly difficult to solve.

Educationally disadvantaged students may have serious problems with motivation to learn, responsibility for learning, and interactions with school people and programs that seem unresponsive to their learning problems. Students who are economically disadvantaged often feel that they cannot compete with their classmates (e.g., in their clothes, leisure activities, attitudes about families) and that they cannot afford to think through and beyond high school because of their need to work for pay as soon as possible to assist their families and to obtain for themselves the material trappings of adolescence. Students who are educationally and economically disadvantaged have both sets of problems, and the economic pressures to leave school exacerbate the motivational problems students feel when they have failed courses or full years of schooling. Schools cannot easily solve students' economic disadvantages, but they can organize programs that minimize distinctions that depend on economic resources. Schools can help students solve their educational disadvantages by creating, implementing, and evaluating ever more effective programs.

There will never be a magic pill or potion or quick fix that assures successful programs for all middle grades schools and all early adolescent students. Educators must be alert to new programs that will help them develop school environments that are challenging, exciting, fair, and supportive so that students will want to participate in and be judged by the system. This paper offers ideas, issues, and examples of programs that recognize that high content education is the ultimate equalizer for educationally and economically disadvantaged students.

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APPENDIX: DIRECTORY OF PROMISING PROGRAMS

This Appendix is a directory of the promising programs mentioned in the text. We must reiterate that few of the programs have been adequately evaluated. This means that educators must review the descriptions, procedures, materials, and available evaluations of these programs with some skepticism, and with an eye to what might help their own schools reach important goals. Most programs and materials will have to be adapted, rather than adopted outright. This suggests that school-based and school district-based processes are needed to review promising programs, to select or design programs, to organize and conduct staff development, to implement and evaluate programs.

MATH: PROMISING PROGRAMS FOR THE MIDDLE GRADES

PROGRAM NAME	CONTACT OR REFERENCE	GRADE	RECOGNITION	DESIGNED FOR DISADVANTAGED
Calculator Assisted Mathematics for Everyday Living (CAMEL)	Carolyn Williams The School Board of Volusia County P.O. Box 1910 Daytona Beach, FL 32015 (904) 328-8811	9 - 10	PEP	Yes
Chapter 1 Mathematics Improvement Program	Annette King, Coordinator Akron Public Schools South Education Center 1055 East Avenue Akron, OH 44307	2 - 6	Chap1	Yes
Chapter 1 Mathematics Project	Constance Pace, Curriculum Coordinator School District of the City of Niagara Falls Administration Building, 607 Walnut Avenue Niagara Falls, NY 14301 (716) 286-4246	K - 8	Chap1	
Chapter 1 Reading and Mathematics	Mrs. Veola Hymes, Coordinator Muscogee County School District 1830 Shepherd Drive Columbus, GA 31906 (404) 322-2999	2 - 10	Chap1	Yes
Classmate 88	Janice M. Putz, Chapter 1 Director South Bend Community School Corporation 635 South Main Street South Bend, IN 46601 (219) 282-4181	4 - 6	PEP	Yes
Comprehensive School Mathematics Program (CSMP)	Clare Heidema, Director Mid-Continent Regional Educational Laboratory 12500 E. Iliff Avenue Suite 201 Aurora, CO 80014	K - 6	PEP	

Conceptually Oriented Mathematics Program (COMP)	Lynne Hall, Assistant Director 161 East First Street Mesa, AZ 85201 (602) 969-4880	K - 8	PEP	
Individualized Prescriptive Arithmetic Skills System (IPASS)	Robert Reynolds, Director Pawtucket School Department Edward J. Creamer Building, Park Place Pawtucket, RI 02860 (401) 728-2120	1 - 8	PEP	Yes
Math Motivational Centers (M^2C)	Carolyn Rosenfeld or Raymond Senes Norwalk Board of Education 105 Main Street Norwalk, CT 06825 (203) 847-0481	9	PEP	
Mathematics Achievement Program (MAP)	John Williams, Math Program Manager Parry Building Ninth and Fulton Streets Chester, PA 19013 (215) 447-3860	2 - 5	PEP	Yes
Middle Grades Mathematics Project	Dr. William Fitzgerald Mathematics Department Michigan State University East Lansing, MI 48824	6 - 8		
Operation Uplift	Dr. Joseph H. Kyle Roanoke County Schools 526 College Avenue Salem, VA 24153 (703) 387-6422	1 - 6	Chap1	Yes
Systematic Teaching and Measuring Mathematics (STAMM)	Sherry Stumbaugh, Director Project STAMM 1005 Wadsworth Boulevard Lakewood, CO 80215 (303) 231-2381	K - 12	PEP	
Teaching Everyone About Math (T.E.A.M.)	Dr. H. Dean Evans Indiana Department of Education Room 229, State House Indianapolis, IN 46204-2798 (317) 232-6667	6	Chap1	Yes

Team Accelerated Instruction (TAI)	Team Learning Project The Johns Hopkins University 3505 N. Charles Street Baltimore, MD 21218 (301) 338-7570	3 - 6		
The Algebra Project	Moses, R.P., Kamii, M., Swap, S.M. and Howard, J. (1989). The Algebra Project: Organizing in the Spirit of Ella. Harvard Educational Review, 59, (November), 423-443.	6 - 8		
The ESC Mathematics Curriculum	Jostens Learning Corporation 6170 Cornerstone Court East San Diego, CA 92121-3710 (619) 587-0087	1 - 8		
Traner Middle School Chapter 1 Lab	Nancy Hall, Curriculum Specialist Washoe County School District 600 Apple Street Reno, NV 89502 (702) 826-7466	7 - 8	Chap1	Yes

READING: PROMISING PROGRAMS FOR THE MIDDLE GRADES

PROGRAM NAME	CONTACT OR REFERENCE	GRADE	RECOGNITION	DESIGNED FOR DISADVANTAGED
Andover's Integrated Reading System (AIRS)	Theresa Murphy, Executive Director Andover Public Schools Bartlet Street Andover, MA 01810 (617) 470-3800	1 - 8	PEP	
Books and Beyond	Ellie Topolovac, Coordinator Books and Beyond Project 309 N. Rios Solana Beach, CA 92075 (619) 755-8000	PreK - 9	PEP	
Chapter 1 Reading	Charles A. Weber Principal/Chapter 1 Coordinator Neshaminy School District 2001 Old Lincoln Highway Langhorne, PA 19047-3295	2 - 6	Chap1	Yes
Chapter 1 Reading and Math Program	Rose Chatman Dayton Public Schools Roosevelt Center 2013 W. Third Street Dayton, OH 45417-2597	1 - 9	Chap1	Yes
Chapter 1 Remedial Reading: We Can Help Them Read	Nancy Hale, Assistant Superintendent U.S.D. #290 Ottawa Public Schools 420 South Main Street Ottawa, KS 66067	6	Chap1	Yes
Content Reading Including Study Systems (CRISS)	Dr. Carol Santa or Lynn Havens School District #5 233 First Avenue, East Kalispell, MT 59901 (406) 755-5015	10 - 12	PEP	

Cooperative Integrated Reading and Composition (CIRC)	Team Learning Project The Johns Hopkins University 3505 N. Charles Street Baltimore, MD 21218 (301) 338-7570	2 - 6		
Cranston's Comprehensive Reading Program	Roberta Costa, Project Coordinator Department of Reading Services 845 Park Avenue Cranston, RI 02910 (401) 785-0400	K - 12	PEP	
Discoveries in Reading	Harcourt Brace Jovanovich, Inc. National Customer Service Center Dowden Road Orlando, FL 32887 1-800-CALL-HBJ	6 - 10		Yes
ESL Supplemental Program for Limited English Proficient Students	Ms. Diane M. Klotz New London Public Schools 134 Williams Street New London, CT 06320 (203) 447-1435	K - 6	Chap1	Yes
FUTUREPRINT	Charlotte Larson, Project Director DeAnza Reading Center 1450 South Sultana Avenue Ontario, CA 91761 (714) 983-2118	7 - 8	PEP	
HOSTS Reading: Help One Student to Succeed	HOSTS Corporation 1801 D Street, Suite 2 Vancouver, WA 98663-3332	K - 12	PEP	Yes
Individualized Prescriptive Instructional Management System (IPIMS)	George Crissy PEP Trainer - IPIMS Project 27 N. Cayuga Street Union Springs, NY 13160 (315) 252-9309	7 - 12	PEP	Yes
Individualized-Diagnostic-Prescriptive Learning Lab	Bertrand Antoine, Jr. Greenwood Public Schools P.O. Box 1497 Greenwood, MS 38930 (601) 453-4231	3 - 6	Chap1	Yes

PEGASUS-PACE	Peggy Collins, Project Director Tuscaloosa City Board of Education 1100 21st Street, East Tuscaloosa, AL 35405 (205) 759-3511	K - 8	PEP	
Project Leaderprint	Bruce Wellenkamp Ontario Montclair School District Ontario, CA 91764 (714) 983-9501	7 - 8		
Project R-3	Pauline E. Perazzo, Project Director Herbert Hoover Middle School 1635 Park Avenue San Jose, CA 95126 (408) 287-1111	7 - 8	PEP	
Reading Education Accountability Design: Secondary (READ:S)	Lynn Dennis, Director Project READ:S Couer d'Alene Public Schools 311 N. 10th Street Coeur d'Alene, ID 83814 (208) 664-8241	7 - 12	PEP	
Reading, Thinking, and Concept Development	Eric Cooper In-Service Training and Telecommunications 250 James Street Morristown, NJ 07960-1918 (201) 285-7758 or 285-7700	6 - 10		
Structured Teaching in the Area of Reading (STAR)	Camille Aromando Director of Communication Arts 319 East 117th Street New York, NY 10035 (212) 860-5858	2 - 9	Chap1	Yes
Teaching Reading and Interesting New Stories (TRAINS)	Miss Patricia Leavens Greylock School Phelps Avenue North Adams, MA 01247 (413) 664-6568	6 - 8	Chap1	Yes
The Friendly Place	Davidson, J. and Koppenhaver, D. (1988). Adolescent Literacy: What Works and Why. New York: Garland Publishing, Inc.	All ages		Yes

Washington Middle School Reading Intervention Program	Donna Janovitch Yakima Public Schools 104 N. 4th Avenue Yakima, WA 98902 (509) 575-3230	6 - 8	Chap1	Yes
Waukegan Reading Project	Fran McMullen, Chapter 1 Coordinator Waukegan Public Schools Lincoln Center for Educational Services 1201 North Sheridan Road Waukegan, IL 60085	2 - 8	Chap1	Yes
Wilkes County Chapter 1 Project	Mr. Wayne Baker, Director Wilkes County Schools 201 West Main Street Wilkesboro, NC 28697 (919) 667-1121	2 - 8	Chap1	Yes

WRITING AND LANGUAGE ARTS: PROMISING PROGRAMS FOR THE MIDDLE GRADES

PROGRAM NAME	CONTACT OR REFERENCE	GRADE	RECOGNITION	DESIGNED FOR DISADVANTAGED
Elementary Language Arts Team Effort (ELATE)	Cecilia Rinaldi, Chapter 1 Director Bernalillo Public Schools P.O. Box 640 Bernalillo, NM 87004	2 - 6	Chap1	Yes
Ferguson-Florissant Writers Project	Mary Ann Evans, Project Director Administration Center 1005 Waterford Drive Florissant, MO 63033 (314) 831-4411	3 - 12	PEP	
Folger Library Shakespeare Festivals	Judy Kelsey or Peggy O'Brien Shakespeare Festivals Folger Shakespeare Library 201 E. Capitol Street, SE Washington, D.C. 20003	4 - 12	PEP	
Individualized Language Arts	Jeanette Alder, Project Director Weehawken High School Liberty Place Weehawken, NJ 07087 201) 865-1506	1 - College	PEP	
Language Development Magnet School For Secondary Recent Immigrant Students	Dr. Eva Pena-Hughes McAllen Independent School District 2000 N. Twenty-third Street McAllen, TX 78501	Jr. & Sr. High	Chap1	Yes
Project Write	Virginia Stewart Chapter 1 Regional Department Head Dennis-Yarmouth Regional School District 296 Station Avenue South Yarmouth, MA 02664	6 - 8		Yes
Reading English Rotation Project	Marcelyn Hobbs, President Educational Improvement Corporation P.O. Box 475 Thomson, GA 30824 (404) 595-7339	6 - 12	PEP	Yes

The ESC Writing Program	Jostens Learning Corporation 6170 Cornerstone Court East San Diego, CA 92121-3710 (619) 587-0087	4 and up		
The Profile Approach to Writing	V. Faye Hartfiel 1701 Southeast Parkway Suite 99 College Station, TX 77840 (409) 764-9765	3 - 12	PEP	
Thinking To Write	Link, F.R. and Almquist, S. (1987). Thinking to Write. Washington, D.C.: Curriculum Development Associates, Inc.	9 to Adult		
Writing is Thorough and Efficient (WR.I.T.&E.)	Walter J. Vail, Project Director Glassboro Public Schools North Delsea Drive Glassboro, NJ 08028 (609) 881-2290	K - 12	PEP	

THINKING SKILLS: PROMISING PROGRAMS FOR THE MIDDLE GRADES

PROGRAM NAME	CONTACT OR REFERENCE	GRADE	RECOGNITION	DESIGNED FOR DISADVANTAGED
Cognitive Research Trust (CoRT)	de Bono, E. (1983). The Direct Teaching of Thinking as a Skill, Phi Delta Kappan, 64, 10 (June), 703-708.	Middle Grades		
Higher Order Thinking Skills Project (HOTS)	Dr. Stanley Pogrow University of Arizona College of Education Tucson, AZ 85721 (602) 621-1305	3 - 7		
Improve Minimal Proficiencies by Activating Critical Thinking (IMPACT)	Phi Delta Kappan Eighth & Union Streets Box 789 Bloomington, IN 47402-0789 (812) 339-1156	7 - 9	PEP	
Institute for Creative Education	Verne Kelly, Director ERIC 700 Hollydell Court Sewell, NJ 08080 (609) 582-7000	4 - 6	PEP	
Philosophy for Children	Institute for the Advancement of Philosophy for Children Montclair State College Upper Montclair, NJ 07043 (201) 893-4277	K - 12	PEP	
Structure of Intellect (SOI)	Meeker, M. (1969) The SOI: Its Uses and Interpretations. Columbus, OH: Charles Merrill.	1 - 12		
The Touchstones Project	CZM Associates 6 North Cherry Grove Avenue Annapolis, MD 21401 (301) 263-2121	Middle Grades		

SCIENCE: PROMISING PROGRAMS FOR THE MIDDLE GRADES

PROGRAM NAME	CONTACT OR REFERENCE	GRADE	RECOGNITION	DESIGNED FOR DISADVANTAGED
Foundational Approaches In Science Teaching (FAST)	Donald Young University of Hawaii 1776 University Avenue Honolulu, HI 96822 (808) 948-7863	6 - 10	PEP	
Informal Science Study	Kelly Jones University of Houston Room 450, Farish Hall Houston, TX 77004 (713) 749-1692	5 - 12	PEP	
Marine Science Project: FOR SEA	James Kalb, Project Director Marine Science Center 17771 Fjord Drive, NE Poulsbo, WA 98370 (206) 779-5549	1 - 12	PEP	
Survival Strategies	Don Lisowy PEP Project Coordinator New York Zoological Society Bronx, NY 10460 (212) 220-5100	7 - 11	PEP	
The ESC Explorations in Middle School Science	Jostens Learning Corporation 6170 Cornerstone Court East San Diego, CA 92121-3710 (619) 587-0087	Middle Grades		
The Middle Grades Human Biology Curriculum Project	Lorraine Morgan Program in Human Biology Building 80 Stanford, CA 94305-2160 (415) 723-3693	Middle Grades		

SOCIAL STUDIES: PROMISING PROGRAMS FOR THE MIDDLE GRADES

PROGRAM NAME	CONTACT OR REFERENCE	GRADE	RECOGNITION	DESIGNED FOR DISADVANTAGED
Facing History and Ourselves: Holocaust and Human Behavior	Betsy Cohen Facing History and Ourselves National Foundation 25 Kennard Road Brookline, MA 02146 (617) 232-1595	Middle grades - adult	PEP	
Law in a Changing Society (LCS)	Law Focused Education, Inc. P.O. Box 12487 Austin, TX 78711 (512) 463-1388	4 & 5	PEP	
Respecting Ethnic and Cultural Heritage (REACH)	Bettie Sing Luke Project REACH Program Director REACH Center 239 N. McLeod Arlington, VA 98223	7 - 8	PEP	
Teachers Involve Parents in Schoolwork (TIPS) Social Studies and Art	Epstein, J. (1987). Teachers Manual: TIPS Social Studies and Art Process. Baltimore, MD: The Center for Research on Elementary and Middle Schools, The Johns Hopkins University, (November).	6 - 8		
The Civic Achievement Award Program (CAAP)	Close Up Foundation 1235 Jefferson Davis Highway Arlington, VA 22202 (703) 892-5400	5 - 8		

PROMISING PROGRAMS THAT COMBINE COMPONENTS

PROGRAM NAME	CONTACT OR REFERENCE	GRADE	RECOGNITION	DESIGNED FOR DISADVANTAGED
4 Success	Connie Abel Show Low Unified School District #10 500 West Old Linden Road Show Low, AZ 85901 (602) 537-2682	1 - 5		Yes
Central Park East Secondary School	Central Park East Secondary School 1573 Madison Avenue New York, NY 10029 (212) 860-5874, or 860-8935	7 - 12		
Fresh Start Minischool	McBeath, M. et al.(1983). Dropout Prevention: The Name of the Game is Success. Symposium Papers. Symposium papers presented at the Annual Convention of the American Personnel and Guidance Association, (March).	10		Yes
Project Promise	John Shields James P. Timilty Middle School 205 Roxbury Street Roxbury, MA 02119 (617) 445-3114	6 - 8		
Summer Training and Education Program (STEP)	Sipe, C.L., Grossman, J.B., and Millner, J.A. (1987). Summer Training and Education Program (STEP): Report on the 1986 Experience. Philadelphia: Public/Private Ventures, (April).	14 or 15 years old		Yes